THE ENGINEERING AND MINING JOURNAL.

VOL. XIII.—No. 5.—FOURTH SERIES.] NEW YORK, TUESDAY, JANUARY 30, 1872. PRICE 10 CENTS PER COPY.

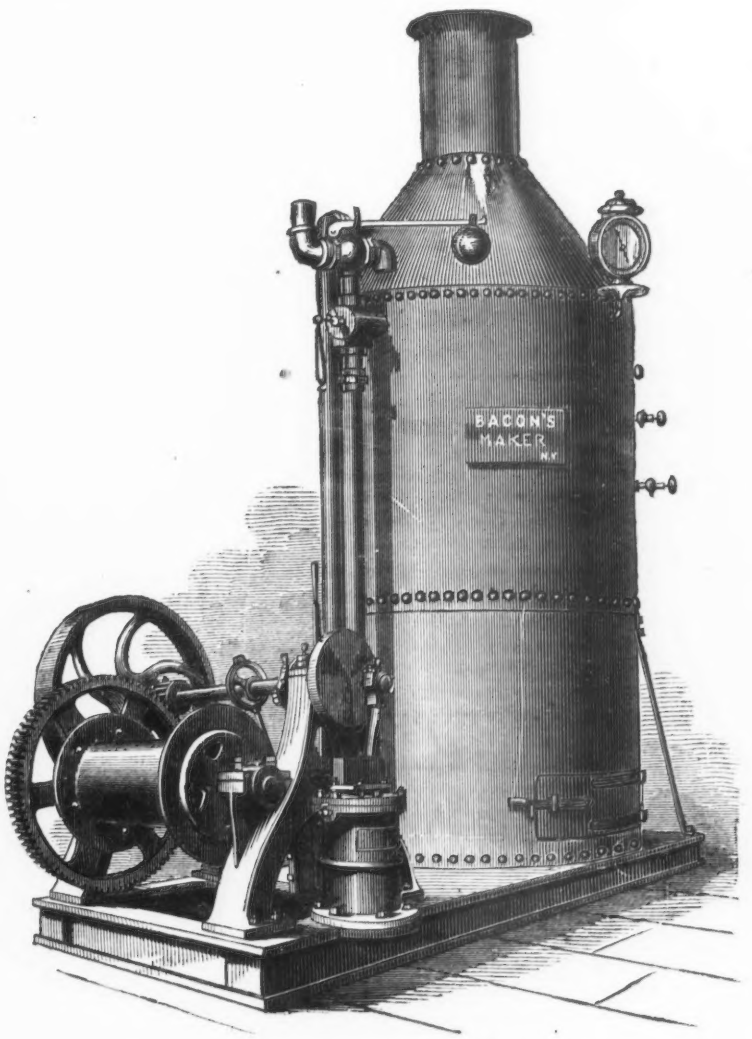
Bacon's Portable Hoisting Engine.

Although this exceedingly compact, effective, and easily operated hoisting engine may be put to a large variety of uses, there is none to which it is better adapted than for mining. The desirability of having in the shaft-house a machine that is perfectly adapted to the purpose for which it is used, is too apparent to need any elucidation on our part. Accidents are frequently due to the lack of such machines, and their use is often exceedingly economical, in a pecuniary point of view, over that of some old affair which may be rigged up for the occasion. For use in quarries for handling large blocks of stone and for raising goods from the holds of ships, in fact wherever heavy weights are to be moved they are well suited.

It is obviously of the utmost importance that the engineer who controls the whole work should have as few rods and levers to move as possible. When a man is trying to raise, swing, and lower a stone weighing several tons, he has no time to give his attention to playing a piano; and some of the engines in use seem really to have as many rods and levers as a piano has keys. In this engine the valve is worked by a link motion in the same way that a locomotive engine is operated, and the result is, that by working a single lever, the several operations of hoisting, lowering, and stopping are accomplished by the direct action of the steam, and without the intervention of brakes, clutches, and similar contrivances. When the engine is used for handling stone, a small drum, which is worked independently, is placed on the crank-shaft and used for swinging the boom, so that the same man that works the engine can place the stone in position, and in this way the labor of one man is saved.

These engines were designed by Mr. EARLE C. BACON, and are manufactured by the Morris County Machine and Iron Company, 36 Cortlandt street, N. Y. They are very substantially made, and, as the engine is not connected with the boiler except by steam and exhaust pipes, there is no danger that the working of the engine will strain the boiler. Moreover, the framing can thus be made much more substantial than in the usual construction, where the engines are attached to the boilers, in which case it is not unusual for the crank-shaft and other parts to get out of line—a thing that never happens with the engine here referred to. Taking all things into consideration, it is clear that this engine must stand, in point of utility, among the first of its class.

Before these engines are allowed to leave the shop, steam is raised, and the engine is run for a sufficient length of time to thoroughly test both boiler and engine. If any defect, which is not discoverable by mere inspection of the machine is found, it is, of course, at once remedied, so that purchasers may be sure that they will get perfect machines.



BACON'S PORTABLE HOISTING ENGINE.

The New Pumping Engine of the Lehigh Zinc Company.

THE following speech of B. C. WEBSTER Esq., President of the Lehigh Zinc Company, at the ceremony which attended the starting of their mammoth engine, contains many interesting items.

This beautiful and fertile valley, in its northeast and southwest course, some 7 miles long by 2 miles wide, is bounded on either side by ridges of syenitic rock, and levelled with magnesian limestone and clay, watered by numerous mountain springs, and drained through its central surface to the Lehigh, by the brook called, by its early Indian possessors, "Saucon." It was brought under cultivation by a few families of original settlers. Increasing in fertility it has remained with them through succeeding generations, and the present honored names of the valley date back to its first settlement. Growing knowledge and improvement in agriculture, has enabled the sons to gain, from divisions of the farms, as much as the sires gained from the whole. The great highway from Northern Pennsylvania to Philadelphia crossed the Valley, and its central village was called Friedensville, village of peace, and so in peaceful beauty it remained, until the year 1845, when on the spot where we now stand, a barren unproductive outcrop was submitted to a learned, studious man, who with satchel and hammer, was by chance passing this way, on a leisure Saturday's stroll of exploration. This man, with trained and observing eyes, our honored guest to-day, who allows himself no title other than Mr. WILLIAM THEODORE ROEPPER, examined and declared it calamine, and then commenced the history which we now review.

At that time the methods of its uses were unknown in this country. Only in Sussex county, N. J., were zinc ores known to exist, and there in a then undeveloped State. After the usual spasmodic movements, consequent upon the discovery of mineral treasures, several citizens of New York united as a company to work the ores, and in their behalf in the year 1853 works for manufacturing white oxide of zinc, were erected in Bethlehem, under the direction of Mr. SAMUEL WETHERILL, with furnaces and process of his own invention.

In 1859 works for manufacturing metallic zinc by the Belgian method were erected by Mr. JOSEPH WHARTON, this being the first introduction of that art, in any form, into this country. In 1865 the company erected a rolling mill for sheet zinc, it being the first introduction of that art into this country; and all these several works have continued in unremitted activity to this day, their capacity being: for oxide of zinc, 3,000 tons per year; for metallic zinc, 3,600

tons per year; for sheet zinc, 3,000 casks per year, respectively—about one-half the annual consumption of the country, and of known superior qualities, owing to the unusual purity of our ores. The mines have been worked to meet the demands of the several manufactories, amounting in some single years to 17,000 tons, and, in the aggregate, to 300,000 tons of ore, including rich blende, which has been developed in the progress of mining,

At a very early day, and at shallow depth, water was encountered and overcome by a small pump worked by a single horse power; followed by a donkey pump which is now in use for dressing ores. Next came a Burdon's engine of 30-horse power, followed, in 1863, by a Corliss engine of 100-horse power, working a series of centrifugal pumps which found their limit at a depth of 65 feet, with 1,500 gallons of water per minute. At this time the Company decided to make more lasting provision for controlling the water by establishing power to raise 4,000 gallons per minute from a depth of 150 feet, if so much should come, and, to this end, they erected and started in 1865, an engine of 32-inch cylinder and 9 feet stroke, working two 22-inch lifting pumps, to which a third 22-inch lift was soon added, and the shaft carried down to 122 feet in 1866, when it encountered, and, with 17 strokes per minute, raised 5,600 gallons; and there it found the limit of its capacity, though assisted by the Corliss engine and centrifugal pumps, throwing at that depth 1,000 gallons; and by a "Bull" engine of 50-inch cylinder and 10 feet stroke, erected at Hartman mine in 1865 and throwing 1,100 gallons from 144 feet depth, and by an engine of 20-horse power at Correll mine, all together raising 8,000 gallons per minute.

These repeated almost unintermitted efforts had taxed the resources and endurance of the Company near to exhaustion, and they were called to decide whether to prepare for further mastery, or to work out all ores above water level, and when a few years thus sustained should pass, to abandon the mines and as a consequence, the works, as no ores accessible to us were known within reach of living transportation. A careful survey and measurement of the Ueberroth mine showed 23,000 square feet of ore under foot; borings in the open pit went down 75 feet in ore—still solid below. A liberal estimate for this ore, in place, is 12 cubic feet to a ton, and sinking 10 feet over the whole area of this mine alone, will supply the works at their maximum for one year.

We can with truth add that the maintenance of an industry which has, at times, carried 700 names on its monthly pay roll representing, perhaps, four times that number; and the responsibility of wisely handling and developing this gift of nature entrusted to our management, entered fully into the consideration.

Our engineer, Mr. JOHN WEST, had already matured a plan of engine, pumps and shaft for raising 12,000 gallons per minute from 300 feet depth, and in December, 1868, the Company contracted with Messrs. MERRICK of Philadelphia, for this new engine, and a year later with Messrs. I. P. MORRIS & Co. for the pumps, boilers and mountings. The timber for shaft and pump rods was contracted for in Georgia. Sinking the shaft commenced when the contract for the engine was made, in Dec., 1868. The bob wall of solid masonry, 9 feet thick, was commenced on a plat of solid rock, 114 feet below the surface; the foundation for the engine is 32 feet deep below the bed plate; the cylinder is 110 inches in diameter and ten feet stroke, estimated as 1,600 horse-power. The total weight of engine, including girders, is 1,313,330 pounds, equal to 657 net tons, without foundation bolts and plates. Twenty-six pieces weigh each over 7 tons, the heaviest being the four walking beams, each weighing 48,000 pounds.

This house was roofed December 20, 1870, and the first piece of machinery, one of the four beam girders, was raised to its place on top of the bob wall on the 30th of December, 1870—one year ago.

The necessity for going to work without delay has allowed us no time to decorate. We present bare walls, and engine without jacket; but they may be the more acceptable to your inspection as showing construction. We start with two plunger pumps of 30 inch diameter, set in cisterns 87 feet down the shaft, one discharging into the adit 25 feet below the surface; the other discharging into tanks on the surface for condenser and boilers. Below these, two lifting pumps (hung by wire ropes) work to the bottom, 127 feet below the collar of the shaft, or 122 feet below the old zero point, or 75 feet below the level of Saucon Creek, which crosses the road one-half mile south. These pumps will throw 735 gallons per stroke—the engine can work comfortably at twelve strokes per minute, and the power is more than adequate, and the dimensions of the shaft (30½x21½ feet in the clear) ample for doubling this number of pumps, and carrying all to a depth of 300 feet, or 178 feet below the present bottom of the mines, with power still in reserve for what may be required below.

From the beginning, this work has been sustained by our Board of Directors with unfaltering determination and courage, deserving the warmest thanks of all in any way interested. And now they beg, in public, to make grateful acknowledgement to Mr. JOHN WEST for the skill with which he planned the whole, and the fidelity with which he has executed it from the lowest foundation stone to the chimney coping. Mr. WEST will now open the steam valves, and when the engine successfully passes centres we will christen her from the upper floor and run her half an hour; then stop to give opportunity to any who desire to examine the shaft, which is light and dry. While running, we invite you to partake of such cold collation as our limited time for preparation has permitted us to provide, with thanks for your presence to-day to cheer us on our way.

The Sorel Artificial Stone.*

Dr. ADOLPH OTT having spoken on the Béton-Coignet and the Frear Stone a few weeks before, now took up the Sorel Stone. He said: It is characteristic of Portland cement to form with water a stone, similar in composition and physical properties to some of the species of the zeolite family, which we find in various igneous rocks, in sandstones and metalliferous veins. In that stone, nature is imitated as it were, but it is very different with the Sorel cement. The stone produced by this cement is not met with in nature, although in strength and hardness, it is equalled by few, if any of nature's rocks. The cement in question is the discovery of Mr. SOREL in Paris, and is produced by mixing a solution of chloride of magnesium of from 15 to 30° Baumé, in the proper proportions with oxide of magnesium or magnesia. The result obtained is a hydrous basic oxychloride of magnesia.

That calcined magnesia possesses remarkable hydraulic properties had alread been discovered in 1826 by MACLEOD, an employee of the East India Company in Madras, by which he had probably been authorized to search for domestic substitutes for the hydraulic mortars of the mother country.

These experiments were repeated in England with magnesite from Salem, in 1835; the results previously obtained were confirmed, and it was futhermore stated that if the burned magnesite was mixed with sand in the proportion of one to one and a half, it will furnish a stone, adapted for structures of all kinds. In 1836 VICAT stated that pure limestone may be rendered hydraulic by the addition of a sufficient quantity of magnesia. He remarked that the proportion between the burned magnesia and the lime must be from 30 to 40 parts of the former to 40 parts of the latter.

In 1847 PASLEY in his work: "Observations on Limes, Calcareous Earths, etc.," mentioned that he had also produced a good although slowly setting cement, from previously burned carbonate of magnesia. From these remarks it follows that the discovery of ST. BLAIRE DEVILLE, of the hydraulic properties of magnesia, communicated to the Academy of Sciences in 1865, is not new, as expounded by him and accepted by most chemists. The alleged discovery consists in the fact that a specimen of magnesia, prepared from the chloride, after having been exposed to flowing water for some time, had acquired such a degree of hardness that it would scratch marble and although subjected to atmospheric action for six years, it underwent no change. The fact, however, was settled conclusively, that magnesia is not near so efficient in uniting inert bodies, as lime, and that it would not bear a large admixture of sand.

The speaker said that he had deemed the previous observations necessary, in order to show that the mere fact of SOREL's using oxide of magnesium in his cement, was not sufficient to account for its great strength; and, furthermore, that it was not because "certain hydraulic limestones owe their hardness and power of setting under water to magnesia," or "because geologists agree that some of nature's most indestructible rocks contain that substance." He alluded to the fact that *talc* also contains magnesia and yet, that it is the softest of all minerals.

The process of making the Sorel artificial stone was then minutely described. It was divided into four different operations:

1st.—The preparation of the oxide of magnesium.

2nd.—The mixing of sand with inert materials.

3rd.—The mixing of the afore-mentioned materials with chloride of magnesium.

4th.—The moulding of the resulting mixture.

These operations were described as carried out by the Union Stone Company in Boston, the owners of Sorel's patent for the United States.

STRENGTH.

From experiments made by Major Gen. GILLMORE (vide his Practical Treatise on Coignet-Béton and other artificial Stone, New York, 1871,) it follows that in strength and hardness, the Sorel artificial stone surpasses all other known artificial stones and is equalled by few, if any, of the natural stones adapted to building purposes.

The following figures express the crushing pressure per square inch in pounds.

NATURAL STONES.	
Granite, Quincy	15,300
Marble, Montgomery County, Tenn	8,950
Sandstone, strong	5,500
Granite, Patapsco	5,340
Sandstone, Connecticut	3,319
ARTIFICIAL STONES.	
Sorel, Union Stone Company, Boston	21,562
Sorel, Union Stone Company, Boston, magnesia by weight 15 per cent., inert material: fine marble	11,556
Sorel, Union Stone Company, Boston, magnesia by weight ? inert material: marble with colored veneer	7,680
Béton-Coignet, best	7,495
" average	4,670
Concrete, Ransome	6,720
Frear Stone	4,500
Brick, first quality, hard	4,368
English Portland cement, consisting of 1 vol. sand and 1 vol. cement, age six months	3,455
English Portland cement, same mixture, age 3 months	2,518

The strength of the Béton-Coignet was determined by MICHELOT, that of Ransome's concrete by ANSTED, the one of English Portland cement by GRANT, and that of the other stones by General GILLMORE.

The principal business of the Union Stone Co. up to the present time has been the manufacture of emery wheels. Regarding the tensible strength of the material, General GILLMORE says that it may be inferred from the fact, that in the proof trials the wheels are made to revolve with a velocity of from two to three miles per minute at the circumference.

* Abstract of a paper read before the Polytechnic Association.

They do not usually begin to break until a velocity of from four to five miles per minute is attained.

DURABILITY.

In order to test the durability of building materials under exposure to the vicissitudes of the seasons, the so-called frost test, indicated by the French chemist M. BRARD is very generally followed. In this test the crystallization of the sulphate of soda (glaubersalt) is substituted for the freezing of water. The specimens of stone are immersed into a saturated solution of this salt, and after being withdrawn are left to dry. The solution is kept boiling for half an hour each time, and the test is made daily for a week, when the specimen is weighed and the loss determined. Dr. C. T. JACKSON, one of the State Assayers of Massachusetts, has made these tests with the Sorel stone, and reports as follows :

"From this test it is evident that your stone will withstand the action of frost more perfectly than any sandstone or ordinary building stone, now in use. I see no reason why it will not stand as well as granite."

Dr. OTT doubted the reliability of this test, and in support of his view, read a passage from a work by Prof. FUCHS, written in 1829. But, said he, whatever may be the case, it is a fact, that in Boston building blocks made of the Sorel stone have resisted two winters, and at the present time appear, it is said, harder and stronger than before they were touched with frost.

COST.

The total cost of one cubic foot of finished building block varies from 79½ to 81½ cents. If, however, large pebbles and small cobble stones are incorporated into the mixture, the price may be reduced ten or fifteen cents per cubic foot. For these reasons, the Sorel system has been limited in its application to articles like soap-stone stoves, whetstones, medallions, emery wheels, window caps, sills, and other articles of small bulk and great relative value.

"For the peculiar purposes to which it is adapted," says General GILLMORE, " it supplies what has heretofore been felt a great want, and in this field, which is neither narrow nor unvaried, it has no prominent rival."

Polytechnic Association of the American Institute.

Meeting held January 12th, 1872. The President in the chair.

Dr. FEUCHTWANGER read a paper which will be found elsewhere.

The PRESIDENT—During the war the southern portion of our country was very much troubled to get saltpetre. The nitrate of sodium exists in large quantities in this country, and in South America ; and it seems from the paper which has just been read, that the chloride of potassium exists in large quantities in Prussia. Now we only want these two substances, to produce the nitrate of potassium, or saltpetre, and the chloride of sodium, or common salt.

ETCHING ON GLASS.

Dr. FEUCHTWANGER exhibited specimens of glass etched by Mr. C. A. STADE, with hydrofluoric acid, by a new process.

Prof. PHIN stated that microscope lenses may be cleaned by washing them with weak hydrofluoric acid.

Dr. PARMLEE stated that a common method of etching is by printing the pattern with printer's ink on soft paper, transferring it to the glass, and etching the spaces with hydrofluoric acid.

Mr. —— This is done by a stencil plate.

Dr. PARMLEE regarded the use of the stencil plate less convenient than printing ; since the stencil plate necessarily leaves many places which must afterwards be connected by an expert engraver.

Mr. PARTRIDGE regarded the stencil-plate process as cheaper, in consequence of the fact, that an etched glass pattern seldom requires to be duplicated.

Mr. STADE, not being present, further discussion was postponed until he should appear to explain his process.

The PRESIDENT read the following items of scientific news :

I. SILICA, IN ALL ITS VARIETIES, DIAMAGNETIC.—Prof. DOVE has successfully suspended, between the poles of a powerful electro-magnet, sections cut from colorless rock-crystal, smoky quartz, agates composed of alternating layers, chalcedony, jasper, amethyst, and other varieties of quartz. Their uniform behavior in the magnetic field shows that all the different kinds of native silica are diamagnetic.

II. PYRO-ELECTRICITY OF CRYSTALS.—HERR W. HANKEL has examined over sixty varieties of topaz, particularly in reference to their pyro-electric properties, and has been led to the conclusion that pyro-electricity is unnecessarily correlated with hemimorphism, but is a general property of all crystals. In hemimorphic crystals the opposite extremities of the principal axis, being dissimilar, assume opposite polar conditions ; while in crystals having the two ends physically similar, the same polar condition is found at each extremity. In hemimorphic crystals the distribution of electricity seems to depend on the asymmetry of the molecules, and is therefore not altered by an external change of form ; while in those crystals which are not hemimorphic the distribution of electricity depends in a great degree on external form and arrangement, and may, therefore, be modified by a change of shape,

III. SELENITIC MORTAR.—Col. SCOTT of South Kensington, England, has invented a mortar for which several advantages are claimed. It is made by simply mixing with the water used in the preparation of the mortar a small quantity of sulphate of lime in the form of either natural gypsum or plaster of Paris (burnt gypsum); instead of sulphate of lime, protosulphate of iron (green vitriol) may be used, or, better still, sulphuric acid ; for the secret of the process is the effect produced by this acid. However, sufficient acid is contained in gypsum to accomplish the end desired, and the use of gypsum is much the most convenient. The mixture is prepared in the pan of the ordinary mortar mill, lime is added, and after being ground for three or four minutes, the sand, burnt clay, or other ingredients are added, and the whole is ground for ten minutes more. Thus ordinary lime is at once converted into a cement-mortar which sets rapidly and can be used for concrete in brick-laying or in plastering at a cheaper rate than lime prepared in the usual way. Lime thus treated with sulphuric acid or sulphates will take up twice as much sand as when slaked. Tiles joined together by Portland cement, after 14 days were separated by a weight of 56 pounds, while selenitic mortar containing one part lime and five parts sand, under precisely the same conditions, required a weight of 158 pounds to overcome adhesion.

Dr. FEUCHTWANGER—That is quite new ; for it has always been taken for granted that lime and plaster do not agree in mortars.

Dr. PARMLEE and Prof. PHIN expressed a doubt whether the mortar would be as strong as that made by lime and sand.

Mr. T. D. STETSON—In this connection it may be interesting to state how plaster of Paris has been used alone as a mortar. In the sinking of the piers of the Harlem bridge, which were sunk by a modification of the pneumatic process, having cast iron tubes joined together, pushed down into the mud under a pressure of air sufficient to keep the water out, they reached the hard bed about 54 feet below mean low water. Then came the job of filling up with masonry inside. This was done under the care of ERASTUS W. SMITH, whose jobs never attract attention because no accident ever happens to them. In England it has been the practice to build up with masonry. Here the plan has been adopted of filling up with hastily laid material, on which grouting was poured and allowed to set. But Mr. SMITH found that plaster of paris had the property of swelling enough to make it bind inside of the tube very much more than ordinary mortar would. In the construction of the Harlem bridge therefore, he built up with plaster of paris alone. If plaster of paris had the cohesive strength of mortar, it would be very desirable for building in other places. In that case very little cohesive strength was required.

We should make a broad distinction between inventions demonstrated to be of practical utility, and mere theories. As I understand it, this selenitic mortar is only a scheme propounded by somebody, backed by a few petty experiments, and therefore does not stand in a position to be received as an addition to our knowledge.

The PRESIDENT—It is read only for the purpose of having it tested by any one having the opportunity.

IV. ELECTROMOTIVE FORCE OF INDUCTION,—Dr. L. HERMANN has given, in Poggendorff's *Annalen*, the results of a series of experiments undertaken by him for the purpose of ascertaining whether the electromotive force of induction demonstrated by Faraday in liquid conductors was the same as that in metallic ones, other conditions being the same. Since in the latter instance the inducing force is independent of the nature of the metal, the question arises, does this independence of the nature of the induced conductor also extend to liquids, and therefore to all conductors? Dr. HERMANN made three experiments with three different arrangements, all with the same result. He describes the most successful in detail, and then adds, these experiments show with certainty, since the resistance in the induced circuit in all cases is the same, that the electromotive force of the induced current is, in the widest sense of the word, entirely independent of the nature of the induced conductor.

V. TO PREVENT SPONTANEOUS EXPLOSION.—Dr. ZALIWSKI, in a recent memoir, states that the explosive property of some inflammable substances depends upon the hygrometric condition of the atmosphere ; that gunpowder and other explosive materials may become spontaneously explosive, even without any elevation of temperature of the air ; but that the smallest quantity of oxalic acid mixed with such explosive material will prevent spontaneous action. He further states that this fact may be experimentally proved by adding to any explosive mixture—sulphur and chlorate of potash, for example—a certain quantity of oxalic acid, after which the mixture can be heated to the point of fusion without exploding. A fair inference seems to be that the treatment suggested by Dr. ZALIWSKI actually impairs that property in explosives on which their value depends.

Prof. PHIN—That the hygrometric condition of the atmosphere may produce spontaneous combustion, is well known to chemists.

VI. A SPIRAL LEYDEN JAR.—Mr. FREDERICK GUTHRIE in a note to the *Philosophical Magazine* (London) thus describes its construction : A strip of tinfoil four feet long and eight inches wide is placed upon a strip of vulcanized caoutchouc four feet long and one foot wide, in such a way that along both sides there is a margin of four inches of tin foil. A second piece of caoutchouc exactly similar to the first is placed exactly over the first upon the foil. A second piece of tin-foil of the same width as the first, but four inches shorter, is placed on the second caoutchouc above the first foil, with its right-hand end above the right end of the first foil. Its left end of course falls four inches short. A brass wire carrying a knob is laid across the end of the upper foil. The whole is rolled up from the right end and bound. What was the lower of the two foils projects between the two layers of caoutchouc, and may be prolonged around the circumference of the roll ; it forms the outer coating or earth-surface. What was the upper-coating of foil now forms what corresponds to the inner coating of the ordinary jar, and is entirely covered, excepting where it is prolonged as the wire and knob at the centre of the roll. If the sheet caoutchouc be an eighth of an inch in thickness, a jar of very great electrical capacity is obtained in a very compact form, and one which is free from the risk of fracture, and is less impaired than the ordin-

ary jar by atmospheric moisture. A very serviceable modification of this form has been constructed by using for the insulating material sheet ebonite. The ends of the spiral roll are capped with dry mahogany disks. The earth-foil is connected with a brass girdle around the centre of the cylinder, and is not visible. The electric capacity is between four and five times as great as that of a glass jar of the same volume. It has been in use for several months, and appears almost incapable of injury.

VII. PERMANENCE OF SILVER PRINTS.—Mr. M. CAREY LEA, in a communication to *The Philadelphia Photographer*, says: At brief intervals the question of the permanence of ordinary silver prints comes up again and again for discussion. The loss, when the fading takes place, is almost always serious, often irreparable, and those on whom it falls are apt, and not unnaturally, to express themselves with indignation. He repeats the conviction, often before expressed, that a well-made silver print, on albuminized paper, is perfectly permanent if kept with ordinary care. A print placed in an album or portfolio, or laid between the leaves of a book and left in an atmosphere no damper, or otherwise more contaminated than that of an inhabited room, ought to last indefinitely. If it does not, the fault is with the maker of the print and not with the process. Seven years ago he printed some silver positives by different processes, cut them in pieces, and toned these pieces in various ways, which he recounts, and then subdivided them and treated them with various destructive agents. All of these specimens so treated, as well as the originals for comparison, were fastened into a note-book, and the mode of production and after-treatment carefully registered. After an interval of between seven and eight years the originals—that is to say, the portions of the prints which were not subjected to any destructive agency—are fitted to give useful information as to their resisting powers to time. Not a single specimen produced by any of the ordinary methods of printing and toning has faded. He therefore concludes that when prints, made by the methods described, after a longer or shorter interval give indications of perishing, there has been a grave want of care on the part of the printer. That fault lies, as every photographer knows, in the employing of hyposulphite that has been previously used; in fixing too many prints in a given quantity of hyposulphite, and in insufficient and badly managed washing. The wrong that has been done to photography by a neglect of these simple precautions has been incalculable. Even at the present day no one feels any certainty that a purchased photograph will last more than a year or two. There should be some way of reaching and punishing those who impose on the public with half-washed, sulphur-toned prints.

The Potash, Soda and Magnesia Compounds in the Rock Salt Deposits of Stassfurt.

[Read before the Polytechnic Association, January 12, 1872, by Dr. LEWIS FEUCHTWANGER, and accompanied with the exhibition of the saline products of the different strata.]

THE most interesting and important mineral deposits of recent discovery are those of the salt works at Stassfurt, in Prussia. They have produced quite a revolution in domestic economy, giving to the chloride of potassium, which is found at the depth of a thousand feet, a great commercial value. This, with other peculiar salts, was discovered accidentally by the chemist H. ROSE, in the waste of the salt mine. The matter was at first lightly esteemed, the chloride of potassium being even regarded as a nuisance; but it is now thrice as valuable as the rock salt, which was formerly the only product sought. Over 30,000 tons have been extracted and sold in Germany, France and England; 3,000 tons were brought last year to the United States, to be used in manufacturing saltpetre, by converting the chloride of potassium into the nitrate.

Pearl-ashes and pot-ashes were formerly exported from the United States to all foreign countries; but our forests are getting cleared, and these products are no longer largely prepared. Sweden likewise has failed to supply France and England with vegetable ashes; and the development at this juncture of the great potash mineral deposits of Stassfurt is a striking providence.

The salt deposits of that locality underlie the new red sandstone of the Triassic period (called the *Bunter sandstein*), and comprise four distinct levels, having a thickness of nearly 1,000 feet. Beginning at the lowest level we find:—

1. *Anhydrite* (sample shown). The bed comprises rock salt and sulphate of lime, which is anhydrous; 350 feet in thickness.

2. *Polyhalite*, 100 feet in depth, elsewhere frequently of brick red color, but in this locality white. It is composed of sulphate of potash, lime and magnesia; has a weak, bitter taste and fibrous appearance, and is here likewise embedded in rock salt.

3. *Kieserite*, a sulphate of magnesia, associated with salt. The bed is 75 feet in thickness, and has carnallite also in the gangue.

4. *Carnallite*, the potash salt of greatest value. It is properly a double chloride of magnesium and potassium, associated with the rock salt in the following proportions:—

50	per cent.	of the potash salt.
25	"	" magnesia salt.
25	"	" rock salt.

5. *Tachhydrite*, an amorphous salt, composed of chloride of calcium and magnesium.

6. *Sylvite*, a pure chloride of potassium.

7. *Kainite* contains the hydrated chloride of potassium and sulphate of magnesia.

8. *Boracite*, a borate of magnesia, but in this locality containing more of borate of lime. It is amorphous, and unlike the boracite crystals found in the gypsum of Luneburg, in Germany. It resembles more the *Hayesine* of Peru. This mineral has also been called *Stassfurtite*. It is found below the carnallite and only at one locality.

The extent of the great mass of carnallite, which is of a flesh-red color, has been proved by exploration to be equal to 6,000,000 tons of chloride of potassium.

It is quite remarkable that the salts found below the proper salt stratum are mostly hydrated, while the salt and anhydrite are anhydrous. The salt-beds in a large body cover the surface, and on passing downward we meet with the different strata in the following order: kainite, carnallite, sylvite, kieserite, polyhalite, anhydrite with rock-salt.

These deposits have been found also in shafts sunk at Anhalt, half a mile distant from Stassfurt.

Caustic potash and carbonate of potash are produced extensively from the chloride.

There are five products prepared for the trade from these saline materials: 1, chloride of potassium; 2, sulphate of potash; 3, carbonate of potash; 4, sulphate of soda; 5, potash compounds to be used as manures. To these must be added bromine and bromides.

The carnallite, which is the main substance yielding the chloride of potassium, is treated in the following manner: The crude mass contains 16 per cent. of the latter salt. By treating it in a limited quantity of water, a hot solution is formed, containing the chloride of potassium, and leaving the common salt undissolved. This on cooling will deposit the crystals of the chloride of 80-90 per cent., like the present specimen, brought into our market. The mother water is now concentrated and treated with ether, which dissolves the bromine. By adding caustic potash to this ethereal solution, the color at once disappears; on evaporation, the bromide thus obtained is decomposed by sulphuric acid and peroxide of manganese, and the pure bromine is distilled over, of specific gravity 2,966. The bromine and bromides of potassium and sodium have likewise proved a great source of revenue; and yet, since the manufacture at Stassfurt began, the price of these articles has been reduced to a quarter of its former amount.

The origin of the Stassfurt deposits is yet a great mystery. The grounds for believing that sea-water was the prime cause, and that this locality was in former ages an estuary of the sea, are not very valid; nor does it seem likely that salt water has been produced from saline efflorescences, through which the concentrated waters were gradually evaporated, and that the waters at a later period were interrupted by a change in the configuration of the surface of the country.

The presence of boracite leads us to suppose that the various bodies of salts were deposited after their subjection to an internal heat, which caused the diminished hydration, mentioned above, the boracic acid being introduced by the eruptive phenomena, whereby hydrochloric acid may also have been generated, to which the chlorides may owe their existence. It is well known that rock-salt is one of the products of volcanic emanations and of springs in volcanic regions, and it has been shown also that salt may be traced to a certain depth, associated with lavas.

All brine springs rise up through strata of sandstone and red marl. We find in England large beds of rock-salt and brine springs, which have been flowing for 1,000 years.

In the triassic period we find salt, gypsum and magnesian limestone more or less associated, while the gypsum and salt lie in many localities in the blue clay, without the red sandstone. After consideration of the subject, I cannot think but that the origin of rock-salt is derived from the evaporation of lakes and lagoons communicating with the ocean.

A salt lake, on the Abyssinian frontier, exposed to the unmitigated rays of the sun, is known to have been shrunk into an elliptical basin, 7 miles in its transverse axis, which is half filled with water, and the other half, with a sheet of snow-white solid salt.

The Dead Sea is known to contain pure salt in its water.

In the United States the rock-salt deposits of Louisiana are of immense depth. In Nevada are salt deposits 14 feet in thickness and 5 miles square. The salt springs of Illinois pass through five strata of coal, and then through the new red sandstone, and discharge daily thousands of gallons.

[NOTE.—We have printed the statements of the foregoing paper without material alteration, as in duty bound, since it is part of the proceedings of the Polytechnic Association; but we cannot let it pass without some serious corrections. DR. FEUCHTWANGER'S estimate that 30,000 tons of the chloride of potassium have been extracted from this deposit, is ludicrously small. A closer estimate would be 200,000 tons; the *annual* production is 30,000. Again, the hot solution employed in the manufacture contains the chloride of magnesium as well as the chloride of potassium. Nor is the process he describes the best, and for that very reason. The reader may consult for a clear account the U. S. Paris Exposition Reports, J. LAWRENCE SMITH on Industrial Chemistry, p. 39. Finally, we do not understand how Dr. F. can maintain in the face of his Abyssinian and American examples, the notion that rock salt is *always* derived from the evaporation of lakes and lagoons communicating with the ocean. So far as we know, it is only when they have no communication with the ocean that lakes and lagoons deposit salt at all—that is, become super-saturated. The reason is plain enough. The ocean is only about one-tenth as salt as it might become without reaching the point of saturation. It is true, that in many places temporary incursions and recessions of the sea form coast and lagoon-deposits of salt; and it is also true (or at least plausible) that all the salt of sedimentary rocks was at one time or another dissolved in the ocean from which those rocks were deposited; but the re-solution and collection of this salt in inland or subterranean basins, without connection with the ocean, is not only possible but a very probable origin for many saline deposits. The salt lakes of Nevada and Utah have been fresh, since the ocean covered those regions, and have now grown salt again, *for want of communication with the sea.*—ED.]

THE COAL TRADE.

Anthracite Coals.

NEW YORK, January 26, 1872.

WHOLESALE.—The condition of the market has not improved since our last writing. Prices have now reached so low a point that no shipments are being made from the Schuylkill region, except of small lots, which are sold at such prices as can be obtained. No quotations can be given for these lots, and no quotations of Schuylkill coal will be found in our tables this week.

The prices of Lehigh coal continue unchanged. The February prices will be fixed next Thursday, at the meeting of the Lehigh Coal Exchange, which will follow the Scranton sale. The mines are working at a small portion of their maximum capacity, and are sending forward as much coal as is taken, even at the present low rates.

The prices of Lackawanna coal remain unchanged.

In another column will be found the advertisement of the Scranton sale, which will take place next Wednesday, when one hundred and twenty thousand tons are to be disposed of. The amount is large, especially considering the dullness of the market, and dealers generally seem to be expecting a decline. It is useless for us to express any positive opinion regarding the prices which will probably be obtained. If they are lower than those of last month, it seems pretty certain that the trade must have some relief before long. The production of coal at present prices can scarcely be renumerative, unless in exceptionally favored localities, companies will probably put down their prices in conformity with those of the Scranton sale and await the effect upon the miners.

Coal dealers in Trinity building have, for a couple of months past been discounting the prevailing dullness in the state of trade, and now they find it duller than any one had expected.

The winter, thus far, has been so warm that retail dealers have disposed of less than the usual quantity of coal, and hence the demand from that source has been light. The clear cold weather of the past few days will, if it continues, improve matters in this respect.

The prices of Wilkesbarre coal will be fixed next week, after the all important event, the auction sale.

Pittston coal will be delivered, to contractors only, during the month of February at the following rates:—Lump, $4; Steamer, $4; Grate, $4 15; Egg, $4 25; Stove, $4 50; Chestnut, $4.

The following circular of the Pennsylvania Coal Company gives full information as to the way in which this company disposes of its product.

From Mr. ED. H. MEADE, secretary of this company, we learn that they are well satisfied with this plan of disposing of their coal to contractors, and the fact that it has been followed by others is also in its favor.

CIRCULAR NO. 1, 1872.

Pennsylvania Coal Company.

OFFICE, 111 BROADWAY,
NEW YORK, January, 1872.

The Pennsylvania Coal Company will dispose of its production, during the season of navigation of 1872, at prices to be fixed monthly, for deliveries in subsequent months, and is prepared to receive orders upon the following conditions:

FIRST.—Orders will be received for coal, deliverable at Newburgh in equal monthly proportions, during the season of navigation of the Hudson River, or for any particular month or months, in such quantities as may be agreed upon, and upon the usual conditions of sale and shipment of the company's coal, annexed. The prices of coal on such orders to be announced in circulars to be issued by the Company on the 20th of each month, for coal deliverable in the following month, when contractors may accept or decline to take the quota of Coal deliverable in that month, if such prices shall be unsatisfactory.

SECOND.—Such orders will be entered upon the company's books until the 10th day of March next; after which, parties will be notified of the quantities for which their orders shall have been accepted.

THIRD.—Any party may decline to take the coal to which he may be entitled for any month for which the prices are announced as above stated: without forfeiting the right to take the quantities to which he may be entitled for the subsequent months. But parties accepting the prices of coal announced for any month will be bound to send for their quota of coal in that month.

FOURTH.—Any party failing to give notice, in writing, to the company, on or by the 24th of each month, of his intention to take the coal to which he may be otherwise entitled for the subsequent month, will be deemed to have declined, and shall forfeit his right to the quantity awarded to him on his order for that month.

FIFTH.—The season of delivery will cover a period of eight months, to commence on the first of April, 1872, and end on the 10th December, 1872. The ten days of December to be added to and taken as a part of the month of November.

SIXTH.—Freight on the coal in company's boats and barges, from Newburgh to New York, will be at the rate of sixty (60) cents per ton, and to other points on the Hudson River, at the company's schedule rates. To secure delivery of the coal by company boats, agreement therefor must be made at the beginning of the season, or application for such delivery must be made when the quota for any month is accepted.

The quota for each month is to be taken in equitable proportions during the month, at the convenience of the company. Parts of cargoes, resulting from the capacities of vessels or boats, left over in one month will not be delivered in a succeeding month, except at the company's option; the intention being to cancel the obligation of the company for the quota of each month by the deliveries during such period, be the same more or less. In cases where orders have been accepted for delivery at points on the Hudson River, in company's boats, if delivery is delayed for the convenience of the company, it will be made later in the season.

It is unnecessary to refer to the quality of Pittston coal, or the condition in which it is sent to market. No effort will be spared to maintain its deservedly, high character in these respects.

Please fill up and forward your order on the accompanying blank, as soon as convenient, prior to the 10th of March next.

Respectfully,
GEO. A. HOYT,
Treasurer.

CONDITIONS FOR THE SALE AND SHIPMENT OF PITTSTON COAL.

1. Every contract for the delivery of coal must stand upon its own merits, as regards prices, terms, etc.

2. The coal is designated by the names known in the company's business; these names are used in selling or quoting prices; and parties are particularly requested to make use of the same in giving their orders for coal.

3. Captains of vessels going to Newburgh for cargoes, must carry with them an order from one of the company's officers in New York, or from a purchaser who has made previous arrangements with the company for the delivery of his coal.

4. Captains are required to report their vessels at the company's office at Newburgh, on their arrival, and take the berths assigned them by the dock master, in accordance with which they will take their regular turn at loading. Exertions will be made to give them prompt dispatch; but the company will not be liable for demurrage, nor for any consequences attending unavoidable delay.

5. Bills of lading, or other regular testimony of shipment, to be proof of delivery, both as regards time and quantity.

6. Coal shipped on vessels other than the company's barges, to be at the risk of the purchaser.

7. Sub-contracts will not be recognized, except by special arrangement with the company in writing.

8. Every effort will be made by the company for the fulfillment of its contracts in the delivery of coal; but if at any time the operations or business of the company at the mines, or on the roads or canal by which it transports coal to any place where delivery is agreed to be made, are interrupted by floods, breaks, accidents, combinations, or by turnouts, strikes among the miners, boatmen or other employees, for increased wages, or on account of a reduction of the same, or other cause, or by casualties of any kind, the obligations of the company to deliver coal under its contracts or agreements may, at its option, be canceled to the extent of the average daily quantity the purchasers would be entitled to receive under their contracts or agreements during the period of such interruption; and no liability shall accrue to the company for damages by reason of such non-delivery, or for demurrage of vessels or otherwise.

9. The company, when requested by purchasers, will use exertions to procure vessels for the transportation of coal, and to effecting an insurance thereon, but will not assume any responsibility in relation thereto.

10. Should the purchaser neglect or omit to send for the coal during the respective periods within which the same shall be deliverable, the company reserves the right to ship it, or not, at its option, as it arrives or otherwise, at the current rates of freight. But if the coal shall not be so sent for within the periods as above stated, or shipped by the company thereafter, the purchaser shall forfeit his right to take the same.

FREIGHTS.—A slight reduction in freights will be noticed this week to Eastern ports, which have hitherto been so high that New England dealers and manufacturers have been far from having the full benefit of the low prices.

RETAIL.—The Pennsylvania Company is selling coal at retail at their yards at the following prices:—Grate and egg, $4 75; stove, $5 25; chestnut, $4 25; 25c. per ton additional is charged at the yard corner of Fourteenth street and Ninth avenue.

BITUMINOUS COALS.

The demand for these coals continues, and the prices of the Consolidation Company are unchanged. The Central Coal Company of Maryland give us the following quotations:—Delivered in New York, $7, and on board at Baltimore, $4 75.

Anthracite Coal Trade for 1871 and 1872.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending Jan. 20, 1872, compared with the week ending Jan. 21, 1871.

COMPANIES.	1871. WEEK.	1871. TOTAL.	1872. WEEK.	1872. TOTAL.
*Phila & Reading R. R†	4,927	512,031	47,226	384,557
Schuylkill Canal	....	....	....	....
*Lehigh Valley R. R.	1,219	331,357	52,922	391,185
Lehigh & Sus. R. R.	1,941	53,492	25,260	68,690
Lehigh Canal	....	....	....	....
Scranton North	379	847	15,344	38,403
" South	24	91	42,518	128,715
Penn. Coal Co., rail	647	2,030	14,094	48,316
" " " canal	....	.....	....	....
Del. & Hud. Canal Co.	....	....	....	....
" " East	11,168	33,101	13,931	38,425
" " West	2,886	6,598	14,508	19 820
South	2,176	5,291	6,443	21,011
Shamokin	6,243	22,343	7,380	15,955
Trevorton	....	.....	....	....
Lykens Valley Coal Co.	....	2,736	....	62
Wyoming South	....	.....	....	....
Wyoming North	....	.....	....	....
P. N. Y. C. & R. R. Co.	838	32,192	....	....
Williamstown Co'y.	23	17.847	....	....
Big Lick Col.	....	3,009	....	1,489
Total	32,471	1,022,995	239,636	1,156,628
1870	....	....	32,471	1,022,995
Decrease				
Increase			207,165	133,633

* These figures are for the week and fiscal period commencing Nov. 30.
† Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1871 and 1872.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Jan. 20, 1872, compared with week ending Jan. 21, 1871.

COMPANIES.	1871. Week.	1871. Year.	1872. Week.	1872. Year.
C. & O. Canal	.....	.....	....	.....
B. & O. R. R.	12,953	37,410	15,640	49,709
H. & B. T. R. R.	4,071	11,700	6,151	17 941
*Harrisburg & D.	7.201	26,681	10,501	86,042
*L. V. R. R.	....	1,615	....	23,110
P. & N.Y.C. & R. Co.	4,314	30,084	....	....
Cumberl'd Branch Canal	....	.....	....	.....
" Railroad	....	.....	....	.....
Total	28,539	107,490	32,292	166.802
			28,539	176,490
Decrease				
Increase			3,653	69,312

The tonnage of the P. & N. Y. C. & R. R. Co. is included in that of the L. V. R..R. Co.

Huntington and Broad Top R. R. Co.

For week ending Jan. 13, 1872	6,151 tons.
Same time last year	4,071 "
Increase	2,080 "
Decrease	
Total amount shipped to date	17,941 "
Same time last year	11,700 "
Increase	6,241 "
Decrease	

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending Jan. 20, 1872.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	.....	
By Railroad, East	13,931	38,425
" " West	14.508	19,820
" " South	6,443	21,011
Total Tons	34,882	79,256

For the same period last year.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,		
By Railroad, East,	11,168	33,101
" " West	2,886	6,598
" " South	2,176	5 291
Total Tons	16,230	44,990
Increase	34,266	

Shamokin Coal Trade.

For week ending January 20, 1872	7,389 12
Same time last year	6,242 10
Increase	1,147 02
Decrease	
Total amount shipped to date	15,955 10
Same time last year	22,343 06
Increase	6,387 16
Decrease	

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, January 20, 1872.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair		
" Port Carbon	2,848	01
" Pottsville	108	09
" Schuylkill Haven	4,118	18
" Pine Grove	1,161	11
" Tamaqua	30,184	15
" Harrisburg		
" Dauphin		
Total	38,421	14

FOR SHIPMENT BY CANAL.

Passing Frackville Scales		
" Mill Creek "		..
" Schuylkill Valley Scales		
" Mt. Carbon "		
" Cressona "		
" Pine Grove "		
" Tamaqua "		.....
Total		

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap	834	03
" Shamokin	2,942	00
" Herndon		.....
Total	3,826	03

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	293	16
" Lebanon & Pine Grove Branch	87	02
Total	380	18

CONSUMED ON LATERALS.

From Frackville Scales	50	18
" Mill Creek "	530	15
" Schuylkill Valley Scales	866	15
" Mt. Carbon "	713	14
" Cressona "	236	17
" Pine Grove "	183	10
" Tamaqua "	814	03
Total	3,396	12

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	154	19
" " Alburtis, " "	5	17
" " Oreland, G. & N. Br.	805	11
" " Connecting R. R.		..
" " Willow Street R. R.	234	05
Total	1,200	12

BITUMINOUS.

From Harrisburg	10,145	07
" Connecting R. R., G. & N. Br.		
" Junction R. R.	355	19
Total	10,501	06

COAL FOR COMPANY'S USE.

Anthracite	6,612	14
Bituminous	407	18
Total	7,020	12

RECAPITULATION

	Total for Week.	Cor. week last year.	Increase & Decrease.
Passing over Main Line and Leb. Val. Branch	38,421 14	5,565 43	i 32,856 01
For Shipment by Canal			
Shipped Westward via Northern Central R. R.	3,926 06	2,976 06	i 849 17
Shipped West or South from Pine Grove	380 18	777 06	d 396 08
Consumed on Laterals	3,396 12	630 08	i 2,766 04
Lehigh and Wyoming Coal	1,200 12	2,970 05	d 1,769 13
Total Anthracite paying fr'gt	47,225 19	12,919 18	i 34,306 01
Bituminous	10,501 06	5,876 19	i 4,624 07
Total of all kinds paying fr'gt	57,727 05	18,796 17	i 38,930 08
Coal for Company's use	7,020 12	1,830 08	d 5,190 04
Total Tonnage for Week	64,747 17	20,627 05	d 44,120 12
Previously this year	439,245 19	548,500 04	d 109,254 05
Total to date	503,993 16	569,127 09	d 65,133 13

SHIPPED BY CANAL.

From Schuylkill Haven			
" Port Clinton			
Total Tonnage per Week			
Previously this year			
Total to date	13,355 16	36,225 17	d 22,870 01

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending Jan. 20—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1872., tons ct	WEEK 1871., tons ct.	YEAR 1872 tons cwt.	YEAR 1871. tons. cwt.
Wyoming Region	24647 16	1500 10	51573 01	37121 04
Upper Lehigh Region	3530 03		9966 02	4614 03
Beaver Meadow Region				
Hazleton Region	248 15	5 08	527 13	704 05
Mahanoy Region				
Tresckow Region	1061 12		5309 03	1043 03
Mauch Chunk Region	2478 12	597 04	16864 00	14072 08
Totals	32566 18	2103 02	84237 19	57555 06
Increase	30463 16		26682 13	
Decrease				
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	25260 00	1941 09	68690 04	53492 08
Forwarded East of Mch Chunk by Canal				
Delivered at and above Mauch Chunk	1711 04	82 16	4776 09	3408 17
L. V. R. R at Packer'n	366 05	78 17	916 09	654 01
Delivered to L. & B. R. R. at Plymouth Bridge	5229 09		9854 17	
Totals				
Of the above there was transported on acc'nt of L. C. & N. Co	3584 14	597 04	20466 07	15308 15
W.-B. C. & I. Co	16182 11	306 06	33316 11	30248 17
Totals	19767 05	903 10	53782 18	45557 12
Increase	18863 15		8225 06	
Decrease				

Lehigh Coal and Navigation Company,

Report of Coal transported over the Lehigh Canal and L. & S. Div. of Central Railroad of New Jersey for the week ending Jan. 20, 1872, and for the year 1872.

	WEEK.	YEAR.
Forwarded East of Mauch Chunk by Rail	25,260	68,690
Delivered at and above do.,	1,711	4,776
Forwarded East of do., by Canal	....	....
	26,971	73,466
Corresponding period last year—		
Forwarded East of Mauch Chunk by Rail	1,941	53,492
Delivered at and above do.,	82	3,408
Forwarded East of do., by Canal	....	....
	2,024	56,901
Increase on Railroad	24,946	16,565
Decrease " "		
Increase on Canal		
Decrease " "		
Of the above there was transported on account of—		
Lehigh Coal Nav. Co	3,584	20,466
Wilkesbarre Coal & Iron Co	16,182	33,316
	19,767	53,782
Corresponding period last year—		
Lehigh Coal Nav. Co	597	15,308
Wilkesbarre Coal & Iron Co	306	30,248
	903	45,557
Increase	18,863	8,225
Decrease		

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending Jan. 20, 1872, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt.
Total Wyoming	11,174 00	93,975 13
" Hazleton	28,675 12	232,644 10
" Upper Lehigh	42 17	463 12
" Beaver Meadow	17,398 19	99,515 16
" Mahanoy	3,252 00	32,620 18
" Mauch Chunk	27 01	469 11
" Sullivan & Erie	443 02	6,851 04
Total Anthracite	60,943 01	456,021 04
Bituminous Coal via P. & N. Y. R. R.		23,109 18
Bituminous Coal from all sources		883 10
Total by rail and canal	60,943 01	480,014 02
Same time last year	2,932 08	388,853 03
Increase	58,010 13	91,160 19
Decrease		
Forwarded East from Mauch Chunk by rail	52,922 07	391,184 17
Same time last year	1,219 04	331,336 19
Increase	51,703 03	59,847 18
Decrease		

RECAPITULATION.

Forwarded East from Mauch Chunk by rail	52,922 07	391,184 17
Forwarded North from L. & B. Junction	5,129 11	14,807 19
To N. C. R. R., at Mount Carmel		73 06
To L. & S. R. R. at Packerton for rail	377 17	1,653 19
Delivered at M'h Chunk	48 19	359 10
Delivered on line of road above Mauch Chunk	1,019 06	4,238 08
Delivered above Mauch Chunk for use of L. V. R. R.	1,445 01	9,101 03
To L. & S. R. R., at Penn Hav., for railroad		3,638 11
Do. for canal		864 07
At M. Chunk for canal		29 07
Total Anthracite	60,943 01	456,021 04
Bituminous Coal		23,992 18
Total all kinds	60,943 01	480,014 02

This report includes all Bituminous Coal carried over the Lehigh Valley and P. & N. Y. Railroads from December 1st 1870 to date.

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending Jan. 20, 1872.

	1872. WEEK.	1872. YEAR.	1871. WEEK.	1871. YEAR.
By Railway	14,094 08	48,316 07	646 19	2,090 01
" Canal	.....			
Total	14,094 08	48,316 07	646 19	2,090 01
Increase 1872,	46,226 06			

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, Jan. 20, 1872.

	WEEK.	SEASON.
North	48,370 16	130,721 17
South	6,443 10	21,010 14
Total 1872	54,814 06	151,732 11
Corresponding time in 1871 :		
North	Suspension.	
South	"	
Total		
Increase North		
Decrease North		
Increase South		
Decrease South		
Total decrease 1872		
Total increase 1872	54,814 06	151,732 11

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna and Western R. R., for week ending January 20, 1872 :

	Week. Tons. Cwt.	Year. Tons. Cwt.
Shipped North	15,344 08	38,403 04
Shipped South	42,518 09	128,714 11
Total	57,872 17	167,117 15
For the corresponding time last year:		
Shipped North	379 05	846 13
Shipped South	24 01	91 01
Total	403 06	937 14
Increase	57,459 11	166,180 01
Decrease	.....	.....

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Jan. 20, and during the year 1872, compared with the corresponding period of 1871.

WEEK.

	To C. & O. Canal. Tons. Cwt.	To E. & O. R. R. Co Tons Cwt.	Total. Tons. Cwt.
1872	.....	15,640 08	15,640 08
1871	.....	12,953 06	12,953 06
Increase		2,687 02	2,687 02
Decrease			

YEAR.

1872	.....	49,709 00	49,709 00
1871	.....	37,410 02	37,410 02
Increase	.....	12,298 18	12,298 18
Decrease			

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK, Jan. 26. R. A.	W. A.	AT PHILADELPHIA Jan. 26. R. A.	W. A.
SCHUYLKILL.				
Lump	$— —	$— —	— —	— —
Steamer	— —	— —	— —	— —
Broken	— —	— —	— —	— —
Egg	— —	— —	— —	— —
Stove	— —	— —	— —	— —
Chestnut	— —	— —	— —	— —
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	5 00	— —	— —	— —
Broken	4 75	— —	— —	— —
Egg	4 50	— —	— —	— —
Stove	5 25	— —	— —	— —
Chestnut	4 25	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Honey Brook, Le'h W. A.	4 50@5 25		— —	— —
Spring Mountain " "	— —@— —		— —	— —
Sugar Creek	— —@— —		— —	— —
Sugar Loaf	— —@— —		— —	— —
Old Comp'y's	4 25@5 25		— —	— —
Cross Creek " "	— —@— —		— —	— —
Room Run	4 25@5 25		— —	— —
Girardville	" "		— —	— —
McMichael	" "		— —	— —
Shamokin	" "		— —	— —
Lykens Valley	" "	6 00	— —	— —
Broad Top	" "	— —	— —	— —
Hill & Harris	" "	— —	— —	— —
Henry Clay	" "	— —	— —	— —
Powelton	" "	— —	— —	— —

*Dealers in these coals may be found in our advertising columns.

Company Coals.

Jan. 1872.

	L.	Str.	Gra	Eg.	Sto	Chest
*Scranton at E. Port	3 45	4 00	4 00	4 15	5 00	4 05
*Pittston at Weehawken	4 00	4 10	4 15	4 25	5 20	4 00
*Lackawana at Weehawken	4 20	4 35	4 50	4 75	5 00	4 50
Wilk'b're at Hoboken	4 00	4 25	4 40	4 50	5 25	4 25
Old Co. Lehigh at P. John'n	5 00	—	4 75	4 50	5 25	4 25
Lehigh at Eliz. Port	5 00	—	4 75	4 50	5 25	4 25

For freights to different points see "Freights."

* To contractors.

Line Prices for Coal Jan, 1872,

	Lump	Broken	Egg	Stove	Ches'
At Mauch Chunk	4.00	4.00	4.00	4.25	3.00
" Wilkesbarre	3 75	3.75	3.75	4.00	3.00

Prices at Baltimore—JAN., 1872.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 60@5 85
Pittston and Plymouth, do	—@5 60
Shamokin Red or White Ash, do	—@5 40
Lykens Valley Red Ash, do	—@6 30
Zerba Valley	—@— —
Trevorton	—@— —
By retail, all kinds per ton of 2240 lbs	7 00@8 25
Georges Creek & Cumberland f. o. b. at Locust Point for cargoes	4 50@4 70
Fairmont and Clarksburg gas, f. c. b. at L. Point	6 00@6 50
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$— —
Lemon " " "	— —
Cumberland Vein Coal	— —
Consolidation Coal Co.'s on board N. Y.	7 50
Maryland Coal Co. "	7 50

Prices at George't'n, D.C., & Alexandria, Va.

Jan. 1872.

George's Creek and Cumberland f. o. b. for shipping $4 50

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$5 25@5 50
Lykens Valley	6 25@6 50
Shamokin Red or White Ash	5 50@5 75
Trevorton and Zerba Valley	—@—

Prices of Gas Coals.

Jan, 1872.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

Duty, $1 25, gold

	Coarse	Slack.
Block House	$1 75	@1 75
Gowrie	1 75	@1 75

Corrected by Bird, Perkins & Job, 86 South street.

	Coarse.	Culm of Coa
Pictou	$2 25	@1 25
Sydney	2 25	@2 40
Lingan	1 60	@2 80
Little Glace Bay	1 60	@1 80
Caledonia	1 60	@2 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal. 25 per cent. ad valorem on the Culm of Coal

AMERICAN.

	Currency.
Westmoreland	$7 00 @— —
Fairmount Gas Coal Co. of N. Y.	7 00 @— —
Despard Coal Co.	7 00 @— —
Penn	7 00 @— —
Newburg Orrel Gas	— — @— —
West Fairmount Gas Coal	7 00 @— —
AT PHILADELPHIA.	
Powelton	$6 75
TO NEW YORK.	
Provincial	
Sidney	$3 25
Lingan	3 25
Cow Bay	3?5
Port Caledonia	3 37½
Little Glace Bay	3 25

Prices of Foreign Coals.

Jan, 1872.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	12 00@13 00
" House "	18 00@20 00
" Orrel	14 00@16 00
Per ton 2,240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$16 00@17 50
"Cannel, "	18 00@20 00
Per ton 2,000 lbs. delivered.	

Freights.—Jan. 1872.

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore.	Anthracite. From Philadel'a.	Anthracite. From Port, Port Johnston, and Hoboken.	Anthracite. From Newburg....	Anthracite. From Rondout...
Amesbury						
Bangor						
Bath						
Boston	4 25	4 10		3 00		
Bridgeport	3 50	3 50				
Bristol						
Cambridgeport						
Derby						
Dighton		3 75				
East Cambridge						
Fall River	3 50	3 50				
Hackensack						
Hartford						
Jersey City	2 50			55		
Middletown						
Mystic						
New Bedford		3 75				
Newburyport		4 25				
New Haven	3 50	3 60		1 05		
New London		3 50	3 50	1 35		
Newport				1 40		
New York	2 60	2 50		55		
Norwalk				1 05		
Norwich						
Pawtucket						
Portland		4 25		2 50		
Portsmouth, N. H						
Providence		3 50		1 75		
Rockport						
Saco						
Sag Harbor						
Salem		4 25		1 20		
Stamford						
Stonington				1 10		
Taunton				1 25		
Warren						
Washington						
TO RIVER PORTS.						
Albany						
Catskill						
Cocksackie						
Coeyman's						
Cold Spring						
Fishkill						
Haverstraw						
Hudson						
New York						
Nyack						
Poughkeepsie						
Rhinebeck						
Rondout						
Saugerties						
Sing Sing						
Stuyvesant						
Tarrytown						
Troy						
West Point						
Yonkers						

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption	$2 18
For reshipment	

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 72
C. R. R., N. J., Phillipsburgh to Elizabethport	1 06
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$2 13

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R. R. from M. C. to Phillipsb'g	$0 27
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 06
Shipping expenses	25
Wharfage	10
Total	$2 13

TO HOBOKEN.

L. V. R. R., Manch Chunk to Phillipsburgh	$ 72
Morris & Essex R. R. Phillipsburgh to Hoboken	1 06
Shipping expenses	25
Wharfage	10
Total	$2 13

TO SOUTH AMBOY.

L. V. R. R.	72
B. & D. R. R.	91
Cam. & Am. R. R.	
Shipping Expenses,	35
Total	$1 68

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	$6
C. RR. of N. J. Phillipsburgh to Elizabethport	1 06
Shipping expenses	25
Wharfage	10
Total	$ 2 20

MARKET REVIEW.

FOR THE WEEK ENDING JANUARY 27th 1872.

IRON—The market for Scotch Pig remains quiet, but the stock is light, and as there is no disposition on the part of holders to realize, full rates are maintained. No sales of magnitude have transpired since our last. The demand for American, has been rather light since the large sales recently noted, but as there is very little to be had, prices still have an upward tendency. We quote No. 1 $38a$38,50, and No. 2 $37a$37,50. Wrought Scrap continues in moderate request, and we notice sales of 150 tons at $41, and 500 do. on private terms. There has been very little inquiry for either old or new Rails, but prices are steady at former quotations. Refined Bar from store has been further advanced $2,50 per ton, to correspond with the higher prices abroad.

The following are the new figures, Swedes Bar $112,50 a $122,50; American and English Refined Bar, ¼ to 2 inches round and square, 1 to 6 inch by ⅜ to to 1 inch $95; Do. 1¼ to 6 by ¼ & 5-16 & 2½ to 3 round and square $100; Do. 1 & 1½ by ¼ & 5-16 $102,50; Scroll $102,50 a $112,50; Oval and Half round $110 a $130; Band $107,50. Horse Shoe $107,50 a $117,50; Rod ⅜ to 3-16 inch $100 a $135; Hoop $115 a $162,50; Large Rounds $105 a $110; Nail Rod 7¼ cents, Norway Shapes 7, and Norway Bar (⅜ to 2 inch) 6, all net cash. Spring Steel 1 to 4 by No. 1 to 4, is quoted 7¾ cents; Tire Steel 8 a 10, as to sizes; Toe Calk and Blow Steel 8, and Sleigh Shoe 7½ cash. Swedes Iron Large Rounds, and Band Iron have not changed—all others are $2,50 per ton higher. Burden's Best Iron is quoted $10 higher, or say $120 for ordinary sizes Round and Square and Flat to $97,50; Extra sizes do. $102,50 @ $127,50; Ovals $112,50 a $127,50; Half Ovals $117,50 a $132,50; and Half Round $112,50 a $127,50 all net cash. Common Sheets are firm at our quotations—600 blds. American R. G. Charcoal, sold within our range, and 300 do. Galvanized, 20 per cent. discount from List. Sound Russia Sheet is quoted about 15 cents gold—75 packs Stained sold on private terms—We understand that all the Russia Sheet for next season's delivery at St. Petersburg (say 20,000 packs) has been bought on New York and Boston account.

The following is from the weekly circular of Mr. EDWARD SAMUEL, Philadelphia, January 22, 1872:—"In Pig Iron there has been a comparative lull, but holders are firm, and there is but little chance of declining figures for many months. Old Rails and Scrap are extremely scarce and in demand. An offer of $43 gold for 4000 tons of DH for early Spring shipment from the other side was declined by a New York house, yet sales of small lots have been made at $41,50 gold for T, to arrive. Manufactured Iron continues in fair demand at quoted prices. New Rails are low in comparison with raw material, and it is more than probable that prices will be enhanced in a few weeks."

LEAD.—Foreign Pig is very quiet, and we have only to notice the sale of 25 tons Spanish at 6 cents gold. Bar is steady at 9¼ cents, Sheet and Pipe, 10, and Tin-lined Pipe 15, usual discount to the Trade.

COPPER.—New Sheathing is firm at 31 cents, and Bolts and Braziers 36. Bronze and Yellow Metal Sheathing 26, and Bolts and Nails 26, cash. Ingot is less active, but prices have further advanced; the sales are 100,000 lb. Lake at 28¼ cents, and 25,000 lb. Quincy, 28⅜ cash, closing strong at these figures, and 28½ a 28¾ cents for February.

STEEL.—The market continues very strong for both domestic and foreign make, with a good demand for both.

SPELTER.—The market for considerable parcels is very dull; the receipts recently have been large, nearly all of which have been bonded. Good brands of Silesian cannot now be quoted over 7 cents gold, though higher rates have to be paid for small parcels.

TIN.—The demand for Pig is still limited, and the market is rather unsettled, prices favor buyers, and we slightly reduce our quotations; we have only to notice sales of 100 slabs, Straits at 37 cents, and 100 do. at a private price; at the close the nominal quotations were, for Banca 41 a 41½ cents, Straits 37, and English 36¼ a 36½, all gold. The business in Plates continues large, though toward the close there was, perhaps, less disposition to buy at the rates now ruling, full, if not rather higher prices, however are demanded; sales have been made of 1800 bxs. Assorted Charcoal Tin at $10 a $10.25; 500 do to arrive. $10.12½; 4000 do. half Extras, January, February and March shipments, $10.12½; 2500 do. Charcoal Terne, $8 75 a $8.87½; 1000 do., part to arrive, $9 a 9.12½; and 500 do. Coke Terne, $8.25, all gold. S. T. P. Charcoal Terne are held at $9.75, and M. F. $10.50, gold.

ZINC.—Sheet continues steady and firm at previous quotations—100 casks Mosselmann sold from agents' hands, at 9½ cents, gold. American oxide Zinc 7 a 7½, Manganese 4 a 4½.

METALS.

NEW YORK, Jan 27, 1872.

IRON.—Duty: Bars, 1 to 1¼ cents ℔ lb; Railroad, 70 cents ℔ 100 lbs.; Boiler and Plate, 1¼ cents ℔ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ℔ lb; Pig, $7 ℔ ton; Polished Sheet, 3 cts. ℔ lb; Galvanized 2¼; Scrap Cast, $6; Wrought, $8 per ton.

	Store Prices
Pig, Scotch No. 1, ℔ ton	36 00@42 00
Pig, American, No. 1	38 00@38 50
Pig, American, No. 2	37 00@37 50
Pig, American, Forge	35 00@36 00
Bar Refined, English and American	—@86 00
Bar Swedes, assorted sizes (gold)	85 00@103 00
	Store Prices, Cash.
Bar, Swedes	112 50@122 50
Scroll	112 50@142 50
Oval and half-round	110 00@130 00
Band	—@107 50
Horse Shoe	107 50@117 50
Rods, ⅜ to 3-16 inch	100 00@135 00
Hoop	115 00@162 50
Nail rod	7¼@— —
Sheet, Russia, as to assortment (gold)	15 @—15½
Sheet, Single, D. and T. Common	—5½@— 6
Sheet, D. and T. Charcoal	—6 @— 6¼
Sheet, Galv'd, Nos. 14 to 26	20 to 30 ct. dis. 10@13c lb.
" " Nos. 27, 28, and 29	20 to 30 ct. dis. 15@19c lb.
Rails, English (gold), ℔ ton	61 00 @62 00
Rails, American, at Works in Pa.	70 00 @72 00

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ℔ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ℔ lb	— @— 34
Copper Bolts	— @— 36
Copper Braziers, 16oz. and over	— @— 36
Copper Nails	— @— 40
Copper, Old Sheathing, &c. mixed lots	25¼@— 26
Copper, Old, for chemical purposes, 14@16 oz.	— @— —
Copper, American Ingot	28¼@— 28
Yellow Metal, New Sheathing & Bronze	— @— 26
Yellow Metal Bolts	26 @— —
Yellow Metal Nails	— @— 26

LEAD.—Duty: Pig, $2 ℔ 100 lbs.; old Lead, 1½ cents ℔ lb; Pipe and Sheet, 2½ cents ℔ lb.

Galena, ℔ 100 lbs	$— @— —
Spanish (gold)	5 90 @6 00
German, do.	5 90 @6 00
English do.	5 90 @6 25
Bar (net)	9 25 @ —
Pipe (net)	— — @10 00
Sheet	— — @10 00

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ℔ lb.

STEEL.—Duty: Bars and ingots, valued at 7 cents ℔ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ℔ lb; over 11 cents, 3½ cents ℔ lb, and 10 ℔ cent ad val. (Store prices.

English Cast (2d and 1st quality) ℔ lb	— 15 @— 18
English Spring (2d and 1st quality)	— 7 @— 10
English Blister (2d and 1st quality)	— 10 @— 17
English Machinery	— 11 @— 13
English German (2d and 1st quality)	— 10½@— 12
American Blister "Black Diamond"	— — @— 12
American, Cast, Tool do.	— 15 @— 16
American, Spring, do.	— 9 @— 11
American Machinery, do.	— 9 @— 10
American German, do.	— 9 @— 11

TIN.—Duty: Pig, Bars, and Blocks, 15 ℔ cent. ad val.; Plate and Sheets and Terne Plates, 25 ℔ cent.; Roofing 25. ad val.

	Gold ℔ lb.
Banca	41 @41½
Straits	37 @— —
English	36¼@36½

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ℔ box	$10 25 @10 50	$11 00 @11 50
I.C. Coke	9 00 @9 50	10 25 @10 75
Coke Terne	8 00 @8 50	9 00 @ 9 50
Charcoal Terne	9 00 @9 50	10 00 @10 50

SPELTER.—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (gold) p. 100 lb,	6 87½@ 7 12½
Plates, Domestic p. lb.	— 7 @— 11

ZINC.—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c per lb

Sheet per lb.	— 10½@— 11½

San Francisco Stock Market.

BY TELEGRAPH.

Our advices from the San Francisco Stock Board are dated the 23d inst.; the market has rapidly advanced during the daily operations of the week, the advance being uniform and uninterrupted. An unchanged condition of Chollar may be noted as an exception to the general tendency of the list. Crown Point leads the market, being quoted at $610 per share; Belcher is behind $20. One of the most notable features in the report is the advance of Kentuck from $170 to $201. Between the dates of the 19th and 23d inst., that our readers may see the course of the market, we append the quotations for the two dates as annexed.

Savage	69	67
Yellow Jacket	64½	64½
Kentuck	170	201
Chollar Potosi	45	46
Gould & Curry	126	136
Belcher	186	190
Crown Point	600	610
Ophir	58	—
Alpha	2¾	—
Imperial	—	62
Eureka G. V.	—	2½
Meadow Valley	—	—
Amador	—	—

Mining Stocks.

With the exception of a slight decline in Central and La Crosse, the gold list is stronger; the sales for the past week were 1000 shares of La Crosse on Monday, at 19, and on the day following 100 more changed hands at 18c. On the same day a transfer of 5000 shares of Central was effected at 3c. per share. The following table comprises the full report of the Board.

GOLD STOCKS.

	BID.	ASKED
American Flag	—	20
Bates & Baxter	25	—
Benton	—	—
Black Hawk	50	100
Central Gold	1	4
Cons Gregory	15	25
Grass Valley	4	6
Gunnell	8	—
Holman,	—	—
La Crosse	16	20
Liberty	—	—
Mariposa prf.	—	—
Montana	—	—
Rocky Mount.	—	5
Quartz Hill	5	—
Smith & Farmlee	13	20
N. Y. & Eldorado	—	—

Petroleum stocks have decidedly advanced, the only exception being quite a decline in Buchanan Farm. A sale of 1000 shares of United Petroleum Farms was effected on the 24th inst. at 30c., which includes all of the transactions for the week: annexed is the report of the Board.

PETROLEUM STOCKS.

	BID.	ASKED.
Benneboff Run	16	—
Bergen Coal and Oil	—	—
Bliven Oil	—	—
Blood Farm	—	—
Brewvoort	100	—
Buchanan Farm	35	—
Central	50	56
Clinton	—	—
Home	1 10	—
National	—	—
New York & Allegheny	1 50	—
Northern Light	30	—
Phillips Pet	5	10
Pithole Creek	—	1 00
Rathbone Oil	20	—
Rynd Farm	30	250
Second National	—	40
Sherman & E	—	—
Tarr Farm	—	—
United Petroleum Farms	30	35
United States	—	60

DEPARTMENT OF POPULAR SCIENCE.

Polar Explorations.

THE ancient mania for discovering a northwest passage to India has died out. The experience of Arctic navigators demonstrated so conclusively the practical insignificance to commerce of such a passage that the subject lost even its speculative interest. We doubt if many persons would recollect, at least upon sudden asking, whether the question was ever really settled. Yet settled it was, not many years ago, first by a whale, who got a harpoon in him on the Atlantic side, ran away around the north end of everywhere, and came out through Behring's Straits into the Pacific, where he got another harpoon which finished him; and secondly, by a whaling vessel, which made the same trip.

But now the great ambition is to visit the North Pole. There were a dozen or more parties afloat last summer, bound on this enterprise; and many of them are still out. A Swedish expedition in two vessels sailed last May to explore the seas between Greenland and Spitzbergen and Nova Zembla, under charge of Norwegian navigators. On the 25th June the well-known German explorer, VON HEUGHLIN, sailed for a fifteen months' cruise in the Siberian seas, intending to pass through the Strait of Nova Zembla and across the Kara Sea, double the north cape of Asia, and reach the island of New Siberia. Then we have the private expedition of Mr. LAMONT in his steam-yacht, from Scotland to the upper cost of East Greenland (visited last year by a German expedition and never before, we believe, by anybody); and that of Mr. LEIGH SMITH, an Englishman, who is reported off for the Spitzbergen seas. M. OCTAVE PAVY, an adventurous Frenchman, purposes to carry out the plan once proposed by LAMBERT, sledging from Kamtschatka with dogs and deer as far as there is land and solid ice, to the named but untrodden Wrangell Land, and betaking himself, when sound footing fails, to a "modified monitor raft," which will bear him poleward.

The American expedition, under Captain HALL, has been abundantly described. The plan is to cross Melville Bay, and attempt to reach the circumpolar region via Jones' Sound.

One other expedition we have postponed mentioning until the last, because it has already returned, and its achievements are considered by geographers as highly important. We refer to that of PAYER and WEYPRECHT, who left Norway in the Isbjörn, or "Icebear," on the 19th July, and returned on the 3d of October. They penetrated in their little sailing vessel to 79 deg. north latitude, and discovered, to the north of Nova Zembla, an extended open polar sea, where hitherto the charts have represented an immense ice-region impassable to navigators. Nothing but want of provisions prevented their further progress; and their discoveries will lead, this year, to a new attempt to reach the Pole by this route. Many expeditions had tried it before, and failed. Possibly the success of this one is due to an exceptionably favorable year; but Lieutenant PAYER rejects this hypothesis, declaring that the summer of 1871 was pronounced by the Norway walrus hunters and fishermen the worst which had been known for a long time, with respect to ice-navigation, and suggesting that former failures to find the open sea were due to the choice of too early a season for going and return (autumn being the best), and to the adoption of a route too closely hugging the shores of Nova Zembla or Spitzbergen. The remarkable condition of the ice, in the autumn, in the Nova Zembla sea, is ascribed by him to the influence of the Gulf Stream. He cites in corroboration the temperature of the water in September, exceeding that of the air by 4 to 9 degrees Fahrenheit; the prevalence of mist and thunder-storms; the appearance of a sky peculiar to the trades; the constant northward Nova Zembla coast-current; the ultra-marine blue color of the water, characteristic of the Gulf Stream; the remarkable abundance of inferior marine animals, etc. The discovery of walrus in great numbers, in this hitherto unexplored sea, is a valuable economical result of the expedition.

Dr. PETERMANN, the great German geographer, is elated over this expedition, since it confirms his view of the proper route to the North Pole, namely, through the European North Sea, as opposed to the plan of Captain OSBORN, of the British navy, who favors the route through Baffin's Bay and Smith's Sound. The latter has, however, some strong evidence in its favor; and we do not see why the discoveries of WEYPRECHT and PAYER should be regarded as conclusive against it, though they go far to prove that the much disparaged European route will afford, under favorable circumstances, open water to the Pole. As for merely getting there, however, without respect to the means (whether sailing-vessels, steamers, boats, rafts, sledges, or snow-shoes), it is likely enough that the Asiatic or the American parties may achieve that, even before the German expedition is under way. From all appearances it will not be long before the North Pole will have been reached; and the next scientific problem will be how to get back again!—*Christian Union.*

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. It is believed that several names of members and associates elected at the Bethlehem meeting in August, 1871, have been accidentally omitted by reason of a loss of the portion of the records of that meeting. Such persons or their friends are requested to communicate with the Secretary.

II. All members and associates who have not paid their dues, are requested to do so at once, by sending in postal orders, or check or money, ten dollars to the Secretary.

All members and associates who pay their dues for each current year, strictly in advance, will have sent to their address regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute, and all notices of meetings. Back numbers cannot, as a general rule, be sent.

III. It is expected that the more important papers read before the Institute, and the debates thereon, will be published in annual, or semi-annual volumes, to which those members and associates will be entitled who have paid their dues.

IV. Authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called in this connection to rules 12 and 13.

V. The next meeting of the Institute will be held in Philadelphia, beginning on Tuesday, February 20, 1872, at 8 P. M. The Council will meet at 3:30 P. M. of the same day. Messrs. LESLEY, DROWN, BLANDY, FRASER, GAUJOT, and LYMAN are the Local Committee of Arrangements. The sessions will be held at the University of Pennsylvania, in Ninth street, above Chestnut, and the headquarters of members will be at the Bingham House, corner Eleventh and Market streets.

MARTIN CORYELL, Secretary, Wilkesbarre, Pa.

Piling and Selection of Scrap.

SOME of the inferior articles rolled from scrap iron, such as axles, owe that inferiority to the careless manner in which the "piles" are made up by children and persons entirely ignorant of the peculiar properties of iron and steel. At the works where this scrap is used, some of the softest and toughest iron, bolts, wire, hoop iron, old files, axes, saws, etc, are indiscriminately mixed together. To a certain extent each of these qualities have their peculiar welding points. When worked together, one portion that is less refined is too much heated, and consequently deteriorated, before the more highly refined portions have reached a welding heat, and we are thus placed in the awkward dilemma of either burning the one or being unable to weld the other. In the best managed mills the selection and piling of scrap iron for axles is entrusted only to "experts," or those who have had long experience in the selection and working of metals; and car axles made at these establishments have a reputation, and stand tests both theoretical and practical, such as show that this discrimination in selection of the material is a perfectly practical matter. When the selection is left, however, to the careless and incapable, the imperfections in piling become a sure source of danger and disaster.—*Railway Times.*

The Sutro Tunnel Report.

THE report of the Commissioners sent by the Government to investigate, and report upon the feasibility and true merits of the Sutro tunnel, and upon the expediency of extending Government aid to the enterprise has been submitted to the Senate. The following vague abstract from it was transmitted some time ago by the telegraph:

"The Commissioners report that the tunnel is entirely feasible, and may be constructed in less than two and a half years, at a cost of about four and a half millions. They believe that the Comstock lode is a true fissure vein, continuing down indefinitely, and express the opinion that while the tunnel is not a necessity for ventilation or draining, yet any scheme which promises increased economy in the working of the mines and rendering valuable a vast amount of now worthless low-grade ores in the Comstock lode, becomes of national importance. Whether the Sutro Tunnel project fulfils this condition of economy depends on the efficacy of the methods now employed in Germany and other countries of Europe for the concentration and profitable working of low-grade ores. On this point the Commission has not in this country, by personal investigation, been able to obtain the desired information. In conclusion, the report commends the Sutro Tunnel to favorable consideration, as an exploring work for deep mining.

The London *Engineering* of Dec. 15th, 1871, publishes the report of M. M. TRESCA to the "Société d'Encouragement" on Tin-Lined Lead Pipe, from which we extract the following. "Architects, and proprietors, have largely adopted the lining for service pipes, and it is generally admitted that this lining removes all danger from the dissolution of the lead, and its consequent sanitary dangers."

M. M. HAMON, of Paris, sold in 1869 300,000 Kilogrammes.

New Use for Silicate of Soda.

ACCORDING to C. MÈNE the substance alluded to, in rather concentrated state, is first mixed with zinc-white (oxide of zinc of commerce), and may then be, as is actually the case in France, used as an excellent and resisting paint for out-door work on wood, metal, stone, paper, roofing felt, etc. Combustible substances coated with this material are, moreover, rendered uninflammable.

A New Mining Bill.

THE new mining bill of Hon. A. A. SARGENT has, we learn, passed the House of Representatives, and only needs the sanction of the Senate to become a law. It is, we believe, similar in its provisions to that of Senator STEWART, of Nevada. This bill is ably supported, and stands, we should think, a very fair chance of success.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
WILLARD P. WARD, M. E.
Editors.

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.* It is the Organ of the American Institute of Mining Engineers, and is regularly received and read *by all the members and associates* of that large and, powerful society, *the only one of the kind in this country.* It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees.

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The Postage on THE ENGINEERING AND MINING JOURNAL *is twenty cents a year, payable quarterly in advance, at the office where received.*

THE SCIENTIFIC PUBLISHING CO.

WILLARD P. WARD, MANAGER,
37 Park Row,
P. O. Box 4404. NEW YORK CITY.

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A Mammoth Pumping Engine.

IN another column will be found the address of Mr. B. C. WEBSTER, President of the Lehigh Zinc Company, delivered on the occasion of the starting of the new pumping engine, just erected at the company's mines. In this address will be found many interesting details concerning the discovery of the zinc mines at Friedensville, the operations of the company and construction of this engine.

The history of the whole undertaking from the discovery of the ore to the present time is well worthy of the attention of those interested in mining pursuits, and some of the attending circumstances, more particularly the manner in which the discovery itself was made, deserve the notice of scientific men generally.

Only a few weeks since we alluded to the value of thoroughness in scientific study, and the immense advantage occasionally derived from, what may be termed, the odds and ends of knowledge, which eminent scientific men frequently possess for years, without deriving therefrom any special benefit.

Prof. AGASSIZ was able to determine the species to which some infant fish belonged by an examination of the pigment cells of their skin. In former years he had made examinations and comparisons of the skin of adult fish, and found that the variations of these cells were characteristic of different species. This knowledge, with the quickness which accompanies true talent, he applied to the solution of the extremely difficult problem which had been so unexpectedly presented to him.

Mr. WM. THEODORE ROEPPER strolled out on a pleasant Saturday, in the year 1845, and unexpectedly came upon a little flower which no one but a botanist would be apt to notice, but which led him to suspect the presence of zinc ore. His thorough knowledge of mineralogy then came to his aid, and enabled him to discover the mineral he was in search of, in specimens which one with an ordinary knowledge of minerals would scarcely suspect of containing zinc.

The mines of the Saucon valley may therefore be said to owe their existence to science, for without it the zinc deposits would probably not yet have been worked. But for the intelligent management under which they are placed, they would probably now be about ready to be abandoned, owing to the immense quantities of water which must be pumped out, in order to enable the miners to follow the ore in depth.

Before deciding to make the large outlay which was necessary to free the mines from water, a thorough examination of them was made by competent men. It was found that by sinking ten feet over the entire ore bearing surface of the Ueberroth mine, alone, sufficient ore could be extracted to supply for a year the company's works, which are capable of supplying one-half of the annual demand of the entire country. The wisdom of making this examination we cannot too strongly commend. The outlay required was, as we have said, very large. If made without sufficient knowledge of the benefits which could be derived from it, a heavy loss might have been entailed upon the company; and although the foolishness of such expenditures is very apparent, still numerous instances of just such reckless management, on the part of mining companies, might be adduced.

Mining, like any other business, requires judicious management in order to render it successful. It will be a good thing for our profession when it comes to be regarded by capitalists as a legitimate industry, which by good direction and careful watching should yield fair returns on capital invested, instead of a purely speculative venture.

In conclusion we would call attention to the skill and perseverance of Mr. JOHN WEST, the engineer, who designed and superintended the construction and erection of this immense engine. A double acting engine was preferred to one on the Cornish system on account of economy in the first cost, which was an important item under the circumstances, and not because it was believed to work more economically. From a personal inspection of the engine last summer while it was being erected, we are prepared to speak of the skilful arrangement of the parts of the vast machine, and their perfect adaptability for the purposes for which they were designed. That the engine will prove efficient to perform the work it was intended to accomplish we have no doubt, and this is after all the true criterion by which it should be judged.

The Utah Silver Mining and Smelting Co.

ADVICES from Salt Lake City bring the intelligence that affairs at the mines of the above company have reached the point, which was predicted, before the sale to the English Company, by all American engineers, who had personally occasion to examine those mines, and whose professional honor would not permit them to be influenced by proffered bribes.

This Journal has frequently, and quite recently in a series of articles, taken occasion to warn investors against a certain class of unprincipled men, who infect the Western mining districts, and who by their actions bring discredit on American mines and the profession of mining. The history of the mines of the Utah Silver Mining and Smelting Company is a glaring example of these operations; and although it is probably too late to remedy the case of this particular company, a few words as to the experience, which capitalists may gather from the ruins, may prevent a repetition of the same blunders.

It is well known, that the mines now belonging to the Utah Silver Mining and Smelting Company are neither on mineral bearing *veins*, nor on *large deposits* of ores. The lead ores occur, as in by far the most localities in this part of Utah, in pockets, which are irregularly scattered through the country-rock. And furthermore, the ores themselves are of very low grade, containing not alone an exceedingly small amount of silver, but also of lead, so that the notion would not be entertained in any mining country, of beneficiating these ores by smelting without a preparatory concentration, even if they occurred regularly enough to make their extraction an object.

These mines were secured some time ago by two gentlemen, who have made themselves quite prominent in Nevada and Utah mining districts by their transactions—as usual, for speculative purposes. Both are of course "sharp" men, and consequently they were not at all set back in their scheme, when they found out, that all their labor in covering the hill-side with claims of imaginary "veins" running in all conceivable directions, and in what little actual exploring had been done, would not expose an ore-body sufficiently enticing to make a favorable sale at home. They turned their attention to the English market, and well knowing that at that distance it would be a strong argument for the value of the property if a furnace was built and kept running for a while, this course was determined on. So the services of a metallurgist were secured, and the furnace was erected. The metallurgist, who at the time had no idea of the hidden intentions of the owners, found, of course, after smelting had commenced, that his formerly expressed convictions in regard to unprofitable results were fully confirmed by his experience with the furnace. But his remonstrance only elicited from one of the owners the remark, that he did not care, whether smelting paid or not, and that he only wanted to see the slag running regularly. At the same time rumors became thick, that the property had been offered at an enormous price to an English company. Upon this the metallurgist resigned his position.

Mr. J. R. MURPHY, "M. E.," the man who, several years ago, pronounced the stunning verdict upon the Stetefeldt furnace at Austin, that it was "a scientific monstrosity," and who has of late cut a ridiculous figure in the Utah papers with his "salt flux" for argentiferous lead ores, was selected to fill the gap. It was easy enough to obtain from him a flattering report on the property, containing seductive estimates of profits, as a preliminary document for the use of the vendors. Armed with this, it was not difficult to find the middle-men in England who declared themselves willing to place the mines. To satisfy the custom, an English mining captain was sent out to verify J. R. MURPHY'S report. And to make assurance doubly sure in the eyes of the public, who were expected to subscribe for the shares, a commission was also given by the buyers to an American engineer, who is well known for his extensive experience, and the conscientious caution displayed by him in judging of the value of mining properties. But here came a stumbling block. The English mining captain reported favorably; but the American engineer, "who had no experience in the lead mines of Spain, and did not know anything about the geology and mode of occurrence of lead ores in that country," refused positively to recommend the purchase of the property, and even forgot himself so far

as to declare that these mines, under present circumstances, were not worth working. All efforts and persuasion to get another and more favorable verdict from him proved unavailing to shake his integrity. But even in this perplexing situation the managers of the scheme proved themselves equal to the occasion. A second English expert, who "had had experience in Spanish lead mines," was called in as an "umpire," and made a report, which he says was "conditionally favorable;" and upon this the sale was concluded in England. It was, at the time, the current talk in Salt Lake City, where the low grade of the Bingham cañon ores, was well known, that the views of the English engineers had been materially influenced by the promise of a large share in the profits of the transaction; but for the honor of the profession it is hoped that this may not have been the case.

Now comes the event which, though expected, on this side of the Atlantic, to occur as soon as the paid-up working capital of the company should be exhausted, has, nevertheless, come rather sooner than was anticipated, and in an even more emphatic form. Since the metallurgist above spoken of relinquished his post, some time in July of last year, the furnace has been in operation just 37 days. Then it had to be rebuilt, and another one of 45 tons' capacity was added. During the building of the new furnace it was continually intimated to the stockholders that wonderful dividends would come to them upon its completion. But when it was finished, it was also ascertained that, in spite of tunnels 600 feet in aggregate length, numerous cross-cuts and shafts on the croppings of various pockets, there was no ore in sight worth speaking of. What little ore had been taken out was too poor to cover the cost of the necessary fluxes (iron ore and limestone) and charcoal; and it is now said that 300 tons of outside ore were bought and smelted in the furnace, in order to keep up appearances for a time. A still worse rumor says that what little ore was smelted by MURPHY during the visit of one of the English mining experts, had been carefully picked out for the occasion during the three preceding months, and that while the expert was momentarily away from the furnace, lead bars were carried up to the charging floor and thrown into the furnace, thus bringing the apparent production up to one ton of bullion per hour. In sinking from the floor of the tunnel, the company have, indeed, met a mixture of galena and iron pyrites, which would, however, require the additional cost of dressing and roasting before it could be smelted. The value of this ore is not high enough to cover the present cost of beneficiation.

The English company, who begin to comprehend the swindle, are reported to ask now that Mr. MURPHY take charge of the work for a number of months, and verify the estimates and promises he made in his original report. Will this illustrious personage comply with their request?

The writer visited the mines of the Utah Silver Mining and Smelting Company shortly after the sale to the English company had been concluded. He was, of course, astonished at the large price which rumor said had been obtained for a property so little developed; and this was still more the case when, after assaying several samples which were taken from the mine, he found that the bulk of the ore contained only from 4.6 to 25 per cent. of lead, and 1.21 to 10.93 ozs. of silver per ton. The furnace charges consisted at the same time of

2 baskets of coal at 2½ bushels	= 90 lbs.		
6 shovels of ore (chiefly leadhillite)	= 90 "		
2 " iron ore	= 26 "	}	172 lbs.
2 " limestone	= 26 "		
2 " slag, about	= 30 "		

and a little *salt*, which, the foreman gravely informed the writer, *added greatly to the fusibility of the slag, and caused a more complete extraction of the lead and silver.*

There were, therefore, used 57.7 bushels of coal to one ton of smelting mixture, and 111 bushels of coal per ton of ore. From 10 to 12 tons of ore furnished 4 tons of pig lead.

It is easily seen that, under ordinary circumstances and in favorable localities, such operations could not leave a profit, much less where coal costs from 30 to 33 cents per bushel, and iron ore from $17 to $20 per ton.

As a natural consequence of all this, it is now reported from Salt Lake that the checks of the company are already protested, and that further telegraphic money orders are anxiously awaited from England.

Such is the history of this enterprise, which will undoubtedly do more to shake the credit of American mining in England than all the other mines placed in that market together.

The moral of all this may be found in the following extract from an editorial in the ENGINEERING AND MINING JOURNAL of October 10, 1871, which sounds as if it were written for this particular case:

"First, when any expert of reputation advises against the purchase of a mine at a certain price, two votes cannot 'outvote' him; and so long as our Western country is full of good mines that can be cheaply bought, it is folly to go into doubtful schemes. Secondly, it is folly to send English or other engineers, inexperienced in this country, to report on the value of mines in our new districts. They come in a hurry, see nothing but what they came to see, are in the hands of the vendors during their stay — and are subject to enormous temptations."

As for Mr. J. R. MURPHY, his opinions are not worth the paper on which they are written. We notice his name, with its self-imposed appendage of "M. E.," flourished in several foreign prospectuses. It is enough to taint with suspicion every document in which it appears; and the proprietors or intending purchasers of really good mines would do well to avoid the incubus of a favorable report from MURPHY. A. E.

MINING SUMMARY.

Mining Review for the Past Year.

We make the following extracts from an interesting article in the San Francisco *Bulletin* of Jan. 5.

The past year, although it has not been distinguished for a large production of the precious metals on this Coast, has, nevertheless, been generally propitious to the mining interest; many improvements having been introduced into the business and many substantial gains effected, while capital has come to its aid more freely than ever before. The amount of money invested on account of legitimate mining has greatly exceeded that of any former year; these investments having been made, as a general thing, with such circumspection and judgment as must insure for them favorable results. To the drought that has prevailed, for two successive years, having been especially stringent during that just closed, is due this restricted yield of the precious metals; it having been so severe as to seriously interfere with both vein and placer mining. Owing to this cause many ore crushing mills dependent on water power for propulsion and even a considerable number driven by steam were obliged to remain idle both in this and the adjoining State of Nevada, thereby greatly curtailing the product of both our gold and silver bullion.

The effects, however, of this short supply of water have been most severely felt in the department of placer mining; operations on many of the hydraulic claims, having, from this cause, been brought to a close early in the season. There has not, the past summer, been even enough water to wash the dirt taken from many of the drift diggings; the only kind of mining benefited by the low stage of the streams being wing-dam and river-bed operations, now engaged in only to a limited extent.

CONTINUED ACTIVITY, NOTWITHSTANDING THE DROUGHT.

While the drought has thus diminished for the time being the bullion harvest, it has not been without some resultant benefits. Although destitute of water for working, the owners of many drift claims have continued to get out the auriferous gravel, depositing it in their dump yards, where large quantities of it had accumulated prior to the late heavy rains, ready to be put through the sluices as soon as water could be obtained for the purpose. Immense sums were thus held in reserve, much of which has already been released, and there is little doubt but the whole of it will soon be washed out and sent to swell the bullion shipments from the various drift digging districts of the State. Over a million dollars, it is estimated, had been garnered up in this manner from the several claims in and about the Slate Creek Basin, including the North America and adjacent grounds at the head of that rich locality. It has also happened the past summer that many miners, finding themselves unable to work their placer claims to advantage, have engaged in prospecting for vein mines, the result of which has been discovery and partial development of many valuable gold-bearing quartz lodes, in localities not before thoroughly explored, thereby often enriching themselves and materially enlarging the area of that class of deposits in this State. So, too, in anticipation of a wet winter, much of the leisure forced on the miners by the drought has been employed in the construction of new, cleaning out, enlarging or otherwise improving the old ditches; building new dams, flumes and reservoirs, and in the adoption of other measures for insuring a more extensive and steady supply of water hereafter. In this manner the capacity of these works has been vastly increased—much of this increasement being due to the fact that the miners had so much spare time left them through a lack of water during the summer. The expectation of heavy rainfalls this winter also led to the opening of many new claims and a return to such old ones as could not be worked in ordinary seasons, thereby giving further prospective extension to the scope of productive mines.

Among the owners of vein mines a similar practice has to some extent obtained. Unable to keep their mills running, they have employed their means in the extraction of ores and in effecting a more thorough exploration of their lodes. As a consequence, many of them have large quantities of ore raised and in readiness for crushing, have extensive reserves established, and much other advanced work performed in their mines. Never has so much and such thorough exploratory labor been done in every class of our underground mines as of late. In fact, the past may justly be said to have been, in a large degree,

A YEAR OF PREPARATION AND SCHOOLING.

Much having been accomplished not only in the adoption of measures for insuring an increased water supply, getting out large stocks of ore and auriferous gravel in advance, and in promoting a more systematic exploitation of the mines, but a great deal of practical knowledge has been gained in relation to the different formations and vein systems, their modes of occurrence and the best plans for pursuing, raising and treating the ores.

Invention has been rife during the year, our mill-men and miners giving hearty encouragement to every process or device promising to secure a saving of labor or more efficient mode of amalgamation. As a consequence, a great many economizing agents and a more potent metallurgy has been generally introduced, this spirit of innovation having extended to every line of improvement and pervaded every branch of this industry. Sometimes the gains achieved have related to the mechanical or chemical department, while, again, they have had a bearing on the business conduct and the financial management of affairs.

We have had improved screens, stamps and batteries, mill-gearings, pumps and nozzles; patent drilling machines, furnaces and amalgamators, concentrators for saving the sulphurets, and new methods for their chlorination, with tramways for the cheap and speedy transmission of ore from the mines to the mills, and a great variety of other inventions for expediting operations and saving the metals. Nor in this eagerness for securing larger pecuniary gains have higher considerations been lost sight of, more efficient plans have been adopted for the ventilation of the mines, valuable additions have been made to the safety cage, and a means discovered for laying the nitrous fumes of Giant powder and similar explosives, with numerous other beneficent schemes and agents called in, or suggested, for insuring the health, life and limb of those employed in underground operations, in all which we perceive that our mining population has been undergoing a valuable schooling of late, tending to qualify them for an enlightened and successful prosecution of this great industry which has itself been advanced meantime to a much higher plane than it occupied but a little while ago. In view of the improvements introduced, the reforms inaugurated, and the beneficial changes wrought, it is hardly too much to say that mining as a business has been revolutionized in this

country within the past few years. Certain it is the general results attending this pursuit have within that period been entirely changed, success now being the rule and failure the exception, the very reverse of what it was but a short time since.

FUTURE PRODUCT OF BULLION.

With all these aids and improvements these reforms effected, with so much auriferous earth and milling ore accumulated, and more than all, with the present prospect of an abundant water supply, we may safely count upon an immense production of bullion for the incoming year. Indeed, it is quite likely that the out-turn of the precious metals, including the entire scope of country, west of the Rocky Mountains, will greatly surpass that of any preceeding year.

THE LABOR QUESTION QUIETED AND OTHER TROUBLES OBVIATED.

Despite the crippling effect of the drought, many new mills and smelting works have been erected within the last twelve or eighteen months, the greater portion of them being of large capacity and generally planned after the most approved models. Through the use of the Stetefeldt and other improved styles of furnace for roasting intractable ores, the latter are now being beneficiated with much less trouble and expense than formerly, while the difficulties that at first beset the business of smelting, are being gradually overcome. The most refractory ores are now worked up to 80 per cent. of the pulp assay, and in many cases much closer; that being the standard generally adopted by millmen in making returns for custom worked ores. In smelting, much trouble has been experienced in finding a material for furnace lining able to resist the action of certain agents existing in some of our base metal ores. This was the principal cause of failure in the efforts first put forth in that direction at White Pine. But in, or near almost every locality where this want has become stringent, a stone or other mineral substance has been discovered, that has measurably met, and in some instances, completely obviated this difficulty. So, too, in the matter of fuel. In many of the timberless and sparsely wooded mining districts a fair, and often very excellent article of coal has been found, affording reason to hope that a sufficiency of this fuel may be ultimately obtained in the neighborhood of the mines, thus conditioned to meet all local needs, when the present limited stock of wood is exhausted.

Growing out of the employment of so many labor-saving appliances and improved methods of operating, in conjunction with cheapened material and freights, the result of railroad transportation and other causes of recent origin, mining on this coast has not only received a great impetus, but our millmen have been enabled, with each succeeding year, to work a lower grade of ore with profit; and that without recourse to a reduction of the wages of workmen, which are but a trifle lower now than they were ten years ago. In this connection, it may be observed that the difficulties which formerly prevailed, disturbing for so long a time the happy relations which should always exist between the miners and their employers, appear to have been amicably, and it is to be hoped, permanently ended. Where the question of wages constituted the bone of contention, proprietors have generally yielded the point, though sometimes this trouble has only been gotten over through mutual concessions, while in the matter of the reduction of the hours of labor, the miners have, for the most part, been forced to give way. In so far as the employment of the Chinese is concerned, this cause of difficulty is likely to cure itself, it having been found that these people cannot be used underground, nor generally about the mills to advantage. Since the suppression of the Amador outrages we have heard of no further strikes or other offensive movements on the part of the Labor Leagues and Unions, and it seems probable that we have seen the end of these ill-advised and criminal proceedings; the more industrious, intelligent and well-meaning members of these organizations are begining to perceive, not only the impolicy, but the injustice of such a course, and to feel how often they have been used to their own detriment and debasement by demagogues and drones, who have allied themselves with, or professed a sympathy for their cause, for no other purpose than the promotion of their own selfish and sinister aims.

UTILIZING THE LOW GRADE MATERIAL—PECULIARITIES OF OUR MINES AND MODES OF WORKING.

Some idea may be gained of the improvements lately effected in mining on this coast from the fact that we are now everywhere reducing with profit a class of ores that would not a few years ago have yielded enough to pay the cost of their extraction. In the Washoe district thousands of tons of such ores are being milled annually with satisfactory result, notwithstanding the greater depths from which they have now to be lifted; while the working of the tailings there, that were before suffered to run to waste, constitutes at present a large and lucrative branch of business; extensive mills having been built and other costly preprations made for the purpose. In California large fortunes are being realize by the reduction of gold bearing quartz that affords not more than eight or ten dollars to the ton; and even much money made in milling rock, (where all the conditions are favorable), that gives a gross average return not exceeding six or eight dollars to the ton. With the powerful nozzles, improved under-currents, riffles and other appliances now in use, auriferous gravel can be washed that yields only five cents to the cubic yard; and although it is difficult to see how much more can be accomplished in that direction, it is probable that as in the past, so every coming year will bring with it something gained in the efficiency and economy of this class of operations, thereby giving corresponding enlargement to the area of our available mines and finally carrying this industry into fields now considered hopeless, or perhaps wholly unknown.

NEW DISTRICTS.

With so much to stimulate exertion and quicken the spirit of adventure, the business of prospecting has been active the past year, having, without any hasty movement or undue excitement, been prosecuted with diligence, and resulted in the finding of many new and promising deposits, both in this and the adjoining States and Territories, the most important discoveries having occurred in eastern Nevada and central Utah, the latter being mostly in the vicinity of Salt Lake. In these regions a great extent of metalliferous country, containing many apparently valuable lead and silver-bearing lodes and deposits with some of most undoubted richness, has been discovered. Commanding capital more readily than places farther west, several of these mines have already been sufficiently opened to establish for them a good degree of merit, a few having been developed to a largely productive condition. Though not always marked by the generally accepted evidence of stability, many of them seem to contain large quantities of high grade ore near the surface—a feature of value under any circumstances, and a consideration paramount, where immediate results become, as is often the case, imperative with parties purchasing properties of this kind.

In our other outlying States and Territories, no noteworthy discoveries appear to have occured during the year. In Oregon, Idaho and Montana the finding of some placers of limited extent has awarded the research of the prospector, those met with on Rogue river, Oregon, paying remarkably well. In California, the discovery of some very fair diggings are reported near Drytown, Amador county, and also at Piety Hill, in Shasta county. Everywhere we have accounts of quartz lodes being found and located, as well, also, as deposits of other minerals, especially cinnabar, which occurs abundantly and is now being successfully sought after at many points in the Coast Range.

From Arizona but little indicative of recent progress or good omen reaches us. Not much has been done there the past summer, whether in the way of finding new or giving development to mines previously discovered. About Prescott the old placers have yielded passably well, affording three or four hundred men fair wages during the season. Some small but rich quartz ledges have also been found near that place, with others of greater magnitude and good promises elsewhere in the Territory. Except, however, in the Pine Grove, Bradshaw, Wickenburg, Weaver and Walapai districts, no great amount of actual mining has been done the past year. In the last named locality some important discoveries are claimed to have been made, and just now a good deal of capital is being invested in that district, where also a considerable population has been gathered during the summer. The numerous and well out-fitted party that visited the Pinal Mountains in the month of August, in search of rich placers that rumor had located there, returned soon after, disappointed, having found nothing to repay them for their trouble except some small veins, carrying copper, silver and antimony, and of dubious value. On this occasion the party suffered no molestation from the Apaches, who have so often been made the scape-goat for similar unsuccessful expeditions heretofore.

SALES OF MINES AND OPERATIONS OF STOCKS.

Throughout the entire year the sale of mining properties has been exceedingly active, transactions in this line having been largely beyond precedent. And while the shares of nearly all our active mining companies have appreciated considerably, some going up to an extent hardly ever before witnessed in the Stock Exchange, it is a note-worthy fact that these advances have generally been based on the improved condition or prospects of the mines these shares have represented, and not, as has heretofore frequently happened, resulted from "corners" effected, or the undue use of advantages otherwise gained by one set of operators over another. Bullion receipts and ore in sight are now apt to be made the criterion and controlling consideration in buying shares or otherwise investing in mines, to a much greater extent than formerly.

The sales of mining properties have also been free outside of the Board of Brokers and the operations of dealers in stocks, many first-class mines having been disposed of to parties both at home and abroad. It would be difficult to arrive at an exact computation of the money paid on this account, though it would aggregate a sum of many millions, English capitalists having invested largely in California, Utah, and Nevada. Luckily for both us and them their purchases have generally been fortunate; or if they have occasionally paid too much for their properties, it has been the fault of middle men, promoters in England, who have too often insisted upon the lion's share. Not generally have proprietors here received more for their mines than they were justly worth, as is evinced by the fact that the greater portion of them are willing to receive the pay, or the principal part of it, in the stock of the new companies, asking only sufficient money advances to cover cost of transfer, organization, and to constitute necessary working capital. It has happened, unfortunately, for English investors, that they have sometimes been induced to buy the shares of these companies put on the London market after being duly inflated through the flattering reports of the managers there, deceived, possibly, by the misrepresentations of those in charge of the mines. To buy the shares of any mining company at an advance of two or three hundred per cent. on their par value is a hazardous experiment, and parties attempting it should not feel aggrieved if it sometimes turns out a failure. With so many really good mines competing for a market, there can be no reasonable excuse for parties finding themselves with a poor property on their hands, nor for having paid an exorbitant price for a good one.

Colorado.

From the *Miner* of Jan.'4.

PELICAN LODE.

The discovery of the Pelican is situated on Sherman mountain, on the east bank of Cherokee Gulch. The ground on either side of the gulch rises at a rapid rate and affords a fine opportunity to gain great depth from the surface as the work of drifting east and west on the vein goes on. There are four adits on the vein aggregating in length 420 feet. The depth obtained from the surface in the gulch is 85 feet. The greatest depth obtained from the surface in the lower west adit is about 200 feet. This adit is cut in the gulch by a tunnel about 100 feet in length. A tunnel, 100 feet in, is now being driven 300 feet in length, to cut the vein 110 feet from the surface. When this tunnel shall have been completed perfect drainage of the mine will be secured. A winze is now being sunk on the vein from the lower adit to intersect the line of the long tunnel where it will cut the vein. By the first of June the mine will be in condition to yield 20 tons of rich milling ore a day. The lower, middle and second adits are connected by air shafts or winzes. The mine is well timbered. Every thing is admirably arranged about the mine to secure perfect drainage, safety for the workmen, ventilation and speedy and cheap delivering of the ore at the mouth of the tunnel and adits. Very little stoping has been done on the mine.

The Pelican is a large true fissure vein. The walls are defined with almost mathematical exactness. The north wall is porphyry and the south wall granite. The breadth of the vein between walls averages from five to eight feet The vein matter consists of argentiferous galena, copper, black sulphurets of silver, blende, and native silver. Among many assays we select the following to show the value of the different kinds of ore and rock taken from the Pelican.

Selected specimens of ore

No. 1	2823 ozs.	silver.
" 2	17 00 "	"
" 3 fine gangue	1782 "	"
" 4 blende	428 "	"
" 5 gangue	808 "	"

From the books of the mine and mill certificates we obtain the following information. From the 7th of February, 1871 to Nov. 18th 1871, a little over nine months, the

Pelican has laid a silver egg of the following dimensions.

One hundred and twenty-four and a half tons of 2nd, and 3rd class ore treated at PALMER & NICHOLS and the S. S. R. company's mill gave a yield of 32,280 oz. of silver. The average yield of this lot of ore was 240 ozs. per ton of 2000 lbs. There are at the mine 200 tons of 2nd, and 3rd class ore, worth, at a very low estimate 50,000 ozs. Thirty tons of first class ore at the mine and at Silver Plume mill worth 510 ozs. per ton would be equal to 15,300 ozs. Twenty-seven tons shipped to Swansea, Wales, 510 ozs. per ton would equal 14,770 ozs. Four tons sold to FRANK J. MARSHALL 572 ozs. per ton, would equal 2288 ozs. A small lot, 1 ton, sent to HILL for treatment, 294 ozs.

RECAPITULATION.

Total product in tons - - - - - -	392½
" " " ozs. in silver - - -	113,632

Total cost of mining 392½ tons of ore, transportation, milling, incidental expenses &c. 10,000 ozs. Therefore 113,632—10,000=103,632 ozs. Total clean profit in coin $134,721 60.

The amount of ore in sight in the mine is perfectly startling. As yet only a little ground has been stoped out. The owners have already discharged 10 men because they can not possibly find transportion, or a market for their ore. We examined the books and mill certificates and can assure our readers that the above figures are correct.

BULLION REPORTS AND MINING ITEMS.

PALMER & NICHOLS have shipped since our last issue :

Bar No.	Ozs. Silver.	Fine.	Coin Val.
425	1150 15	899	$1363 56
427	775 60	874	883 65
			$2247 21

Bar 426, weighing only a few ozs., was manufactured for private parties. Value not reported.

The Stewart Silver Reducing Co. have shipped

Brick No.	Oz. Silver.	Fine.	Coin Val.
407	809	650	$ 679.88
Also Lead Bars,			
89	7790	Gold and Silver	402.34
90	925	Gold and Silver	435.30
			$1517.52

BAILY & NOTT have shipped in the last two weeks of December 1871, 49,950 lbs. of smelting ore for, and on account of owners.

There are fifteen teams hauling ore to the Colorado & Boston Smelting Works, Black Hawk, Gilpin county. We have made careful inquiry and find that the value of the monthly shipments of ore from Clear Creek county, to the above works amount to almost $50,000.

CAMPBELL & CLARK shipped during the month of December, 1871, fifteen tons of rich smelting ore for and on account of owners. The ore was taken principally from the ground of the Clark Silver Mining Company, on the Terrible lode.

Nevada.

HUMBOLDT COUNTY.

From the *Silver State* of Dec. 16.

HON. THOS. HARRIS, we understand, has bonded his mine, in Sacramento District, for three months, to Mr. Copland, who went East this week to dispose of the property in the Eastern market. The mine is looking exceedingly well, and promises to be one of the best properties in the county. Mr. HARRIS is now driving ahead on the mine with a force of three men.

BULLION SHIPMENT.

The amount of bullion shipped from the Arizona mine, through WELLS, FARGO & Co., since our last issue, was $6,003.

BULLION SHIPMENT IN 1871.

From the Reese River *Reveille* of Jan. 2.

WELLS FARGO & Co. shipped from this city, during the past year, 1272 bars of bullion weighing 103,231 pounds, and valued at $1,166,707.31. This does not include shipments by the Stage Company, and by fast and slow freight, which would bring the total shipments up to more than two millions, most of which is the product of the mines in the vicinity of this city and Belmont.

E. B. BENJAMIN,
10 Barclay Street,
IMPORTER OF
CHEMISTS AND ASSAYERS' UTENSILS,
In every variety
Assay Balances,
Furnaces,
Chemicals,
Blow Pipe Sets,
In cases and details.
Crucibles, Cupels, etc.
Also, a very large stock of choice and rare chemicals, and glassware for use in laboratories. may 2:1y

Advertisements.

The special advantages of the ENGINEERING AND MINING JOURNAL, *as a medium for advertisers, are so great and so widely known that it may seem almost needless to call attention to them. It is extensively circulated among the engineers of the country and takes a position in this respect before any other publication of the kind. It has a large and constantly increasing circulation among miners and mine owners, and men connected with mining operations generally. As it is the only paper in the country that makes this subject a specialty it has this field entirely to itself, and is the only direct and reliable means of reaching this class of persons. Being kept on file by almost every subscriber, it is doubly valuable as a permanent means of keeping an advertisement before the public. It is the Organ of the* AMERICAN INSTITUTE OF MINING ENGINEERS, *and is regularly received and read* BY ALL THE MEMBERS AND ASSOCIATES *of that large and powerful society.* THE ONLY ONE OF THE KIND IN THIS COUNTRY. *It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees. It is the recognized organ of the coal trade, and is taken extensively by the trade throughout the country, and presents the very best means of reaching that very important class of men.*

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The rates of advertising, compared with those of other weekly industrial publications, are very low, especially when the class of consumers among which its large circulation is almost entirely confined, is taken into consideration.

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Inside Pages.....25 cents a line.
Engravings may head advertisements at the same rate per line, by measurement, as the letter-press.

DIAMONDS AND CARBON furnished and set for drilling rock, sawing or working stone, also *Glasier's Diamonds.* See ENGINEERING AND MINING JOURNAL, January 17, 1871, for further particulars.
Address: JOHN DICKINSON, 64 Nassau st., N. Y.
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New Central Coal Company
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GEORGE'S CREEK CUMBERLAND COAL
OF THE BEST QUALITY.
Delivered on board at Baltimore or Georgetown, or from the Company's wharves at Hoboken.
Orders received by
HARRY CONRAD,
President.
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MARYLAND COAL CO.,
Miners and Shippers of the best George's Creek Cumberland Coal.
Office No. 12 Trinity Building.
W. W. BRAMHALL, Secretary & Treasurer.
A. CHAMBERLIN, President.
jan23:1y JOHN K. SHAW, Vice President.

DETMOLD & COX,
ANTHRACITE AND BITUMINOUS
COALS.
Office, 40 Trinity Building, New York. jan 23:1y

THE DESPARD COAL COMPANY OFFER THEIR Superior DESPARD COAL to Gas Light Companies throughout the country.
MINES IN HARRISON COUNTY, West Virginia.
Wharves, Locust Point, } Baltimore.
Company's Office, No. 29 South st. }
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PARMELEE BROTHERS, No. 32 Pine street, New York. BANGS & HORTON, No. 31 Doane street, Boston.
Among the consumers of Despard Coal we name Manhattan Gas Light Co., New York ; Metropolitan Gas Light Co., New York ; Jersey City Gas Light Co., Jersey City, N. J. ; Washington Gas Light Co., Washington, D. C. Portland Gas Light Co., Portland, Maine.
☞ Reference to them is requested. may30-1y

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From Philadelphia and the Mines,
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From Port Johnston and Jersey City,
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Also the superior CUMBERLAND COALS.

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SEMI-BITUMINOUS,	GEORGES CREEK,	GEORGES CREEK,
at Philadelphia.	at Baltimore.	at Alexandria.

205 Walnut street, Philadelphia; 14 Kilby street, Boston, 34 Westminster st., Providence; 24 Second st., Baltimore,
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Cross Creek Free Burning Lehigh Red Ash
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FROM THE BUCK MOUNTAIN VEIN.
OFFICES:
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Room 43, Trinity Building,
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MINED BY THE
Wilkesbarre Coal & Iron Co.
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NEW YORK.
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OR FOR
PRESHIPMENT FROM COMPANY'S WHARVES,
AT
Port Johnson and Hoboken, New Jersey.

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Of the best quality for manufacturing, steam generating, and domestic purposes.
Orders received by the Cargo at
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STEVENSON & PIERSON,
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G. MEREDITH, South Gay street,
mch7;1t Baltimore.

THE NEWBURGH ORREL COAL COMPANY
Mines at Newburgh, Preston Co., W. Va.
Company's Office, No. 52 S. Gay St. Baltimore, Md.
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This Company offer their very superior Gas Coal at lowest market prices.
It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.
It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York, the Brooklyn and Citizens' Gas Light Companies of Brooklyn, N. Y., the Baltimore Gas Light Company of Baltimore, Md., and Providence Gas Light Company, Providence, R. I.
The best dry coals shipped, and the promptest attention given to orders. sep21-1v

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LEHIGH COALS.
OFFICE:
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98TH AUCTION SALE.
120,000
TONS SCRANTON COAL,
ON WEDNESDAY, JAN. 31ST, 1872.
NEW YORK, January 24, 1871.
The DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY will sell, by Messrs. JOHN H. DRAPER & Co., Auctioneers, at the Company's Sales Room, 26 Exchange Place, corner of William street, New York, on Wednesday, Jan. 31, at 12 o'clock, noon,
120,000 TONS
of COAL, from the Lackawanna regions, of the usual sizes, deliverable at their Depot, Elizabethport, N. J., during the month of February, 1872.
The sale will be positive; each lot put up will be sold to the highest bidder ; no bids, in any form whatever, being made for account of, or on behalf of the Company. The conditions will be fully made known at the time of sale.
TERMS : Fifty cents per ton, payable in current funds, on the day of sale, and the balance, within ten days thereafter if required, at the office of the Company.
SAMUEL SLOAN, President.

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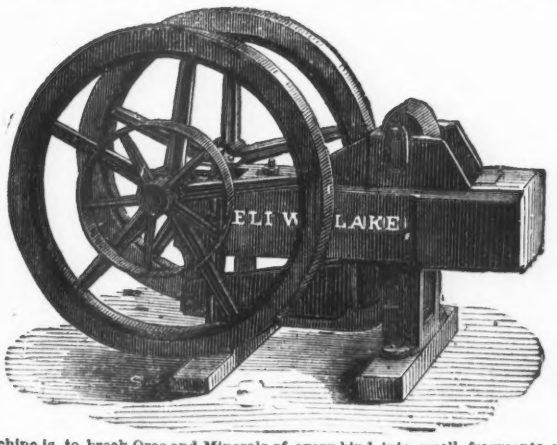

The office of this Machine is to break Ores and Minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

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OXIDE OF ZINC, SPELTER, SHEET ZINC.

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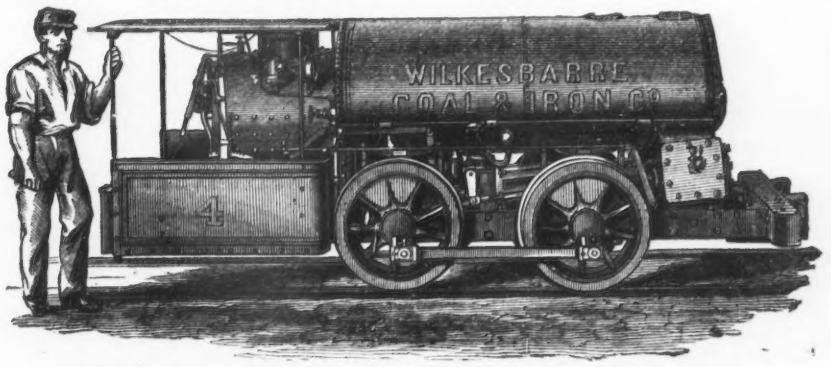

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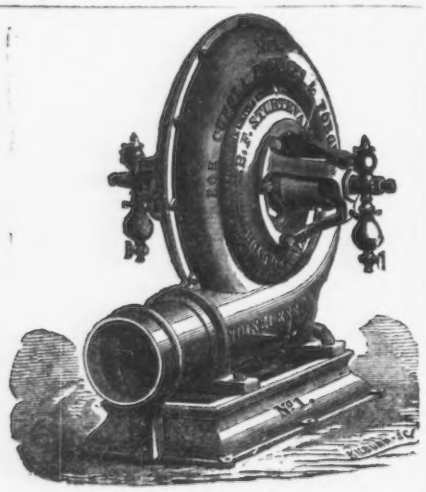

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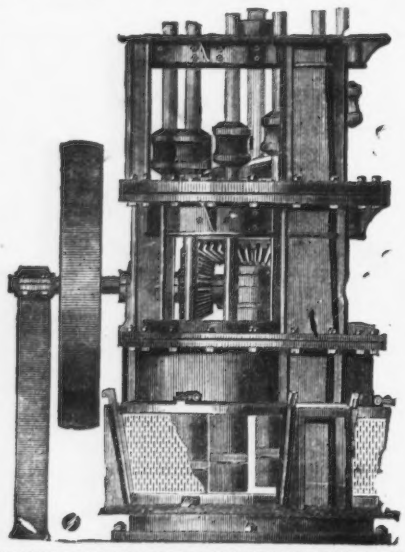

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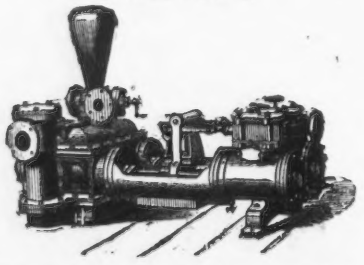

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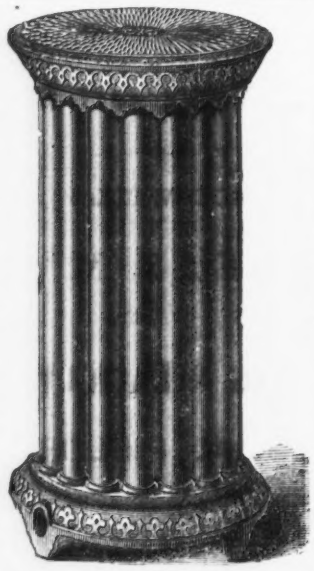

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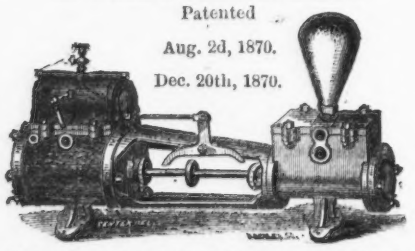

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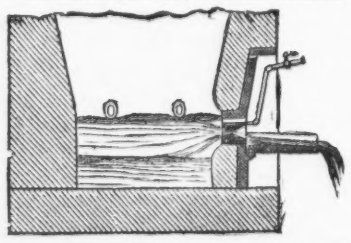

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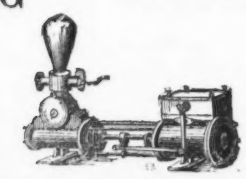

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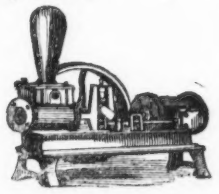

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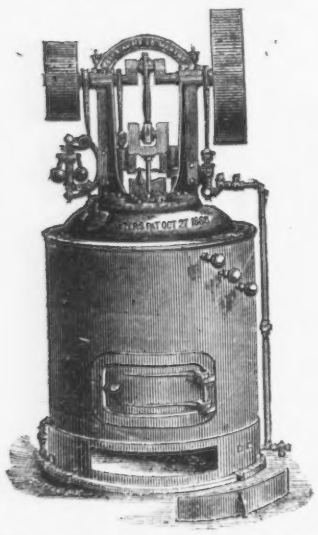

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